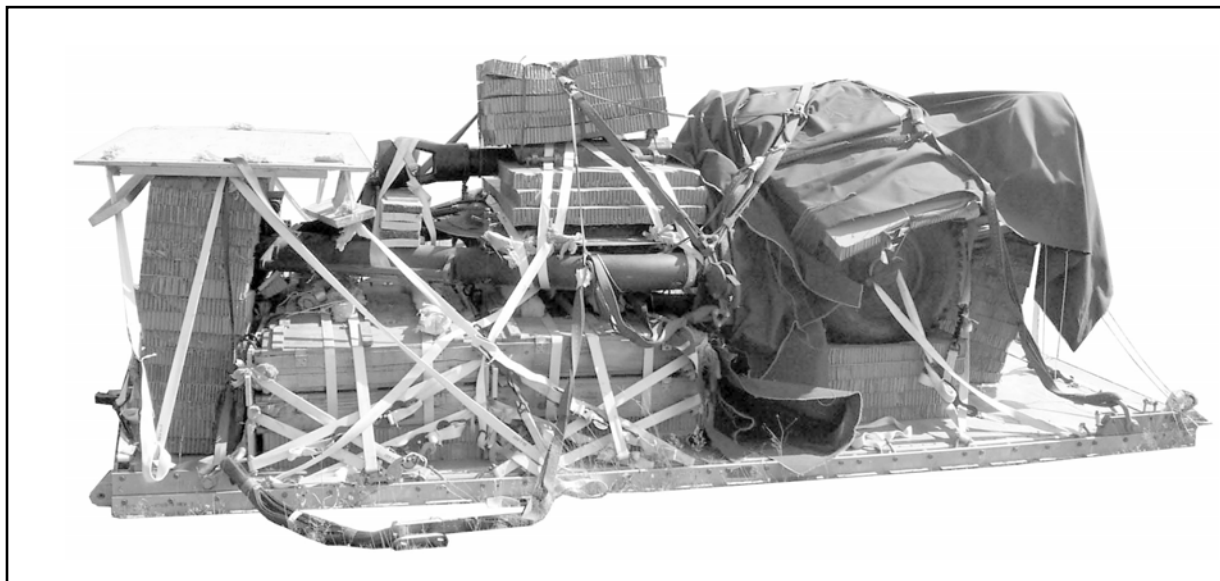




AIRDROP DERIGGING AND RECOVERY PROCEDURES



OCTOBER 2004

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**HEADQUARTERS
DEPARTMENT OF THE ARMY
DEPARTMENT OF THE AIR FORCE**

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HEADQUARTERS
DEPARTMENTS OF THE ARMY
AND THE AIR FORCE
Washington, DC, 7 October 2004

Airdrop Derigging and Recovery Procedures

Contents

	Page
Preface	iii
Scope.....	iii
User Information	iii
 Chapter 1 Responsibilities and Cautions	
Responsibilities.....	1-1
Cautions.....	1-1
 Chapter 2 Airdrop Rigging Components	
General	2-1
Types of Platforms.....	2-1
Outrigger Assembly	2-2
Cargo Slings	2-3
Cargo Parachute Release Assemblies.....	2-4
Link Assemblies.....	2-5
Clevis Assemblies	2-6
Covers	2-6
Modification Hardware Items	2-6
Common Hardware Items.....	2-7
Cargo Covers	2-7
Heavy Drop Derigging System	2-8
Straps and Webbing	2-8
Extraction Force Transfer Coupling (EFTC).....	2-11
Extraction Parachute Jettison System (EPJS)	2-12

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*This publication supersedes FM 10-500-7/TO 13C7-1-10, 20 September 1994.

Chapter 3	Airdrop Derigging Procedures	
	General	3-1
	Airdrop Platform Load Derigging Procedures	3-1
	Airdrop Container Load Derigging Procedures	3-6
	Tools Used for Derigging	3-8
Chapter 4	Airdrop Equipment Recovery Procedures	
Section I	Preparation for Recovery	
	General	4-1
	Preparation for Recovery Operations	4-1
	Principles of Recovery and Evacuation	4-2
Section II	Recovery of Airdrop Equipment on the Drop Zone	
	Recovery Procedures	4-4
	Destruction of Airdrop Equipment	4-7
	Temporary Storage of Parachutes and Related Airdrop Equipment	4-7
Section III	Recovery of Airdrop Equipment on the Aircraft	
	Personnel Equipment	4-8
	Container Delivery System (CDS) Equipment	4-8
	Heavy Drop Equipment	4-9
Chapter 5	Derigging and Recovery Under Special Conditions	
	General	5-1
	Polar Conditions	5-1
	Tropical Conditions	5-2
	Desert Conditions	5-2
	Marine Conditions (water drop zones)	5-3
	Mountainous Conditions	5-3
	Glossary	Glossary-1
	Bibliography	Bibliography-1

Preface

SCOPE

This manual gives the latest approved doctrine for derigging, recovery, and evacuation of airdrop supplies and equipment. It is to be used by acting recovery NCOICs or OICs for a unit receiving airdrop supplies. This manual provides critical instructions for recovery of airdrop supplies and equipment. The instructions include: derigging, recovery, and evacuation responsibilities; identification of airdrop items and components; methods of collecting and handling parachutes and related airdrop equipment for recovery and evacuation; derigging and recovery support requirements; and derigging and recovery under special conditions.

USER INFORMATION

The proponent of this publication is HQ TRADOC. You are encouraged to report any errors or omissions and to suggest ways of making this a better manual.

Army personnel, send your comments on DA Form 2028 directly to:

Director
Aerial Delivery and Field Services Department
USA Quartermaster Center and School
1010 Shop Road
Fort Lee, Virginia 23801-1502

Air Force personnel, send your reports on AFTO Form 22 through your respective command Weapons and Tactics to:

Headquarters
Air Mobility Command (AMC/A39T)
402 Scott Drive, Unit 3AI
Scott AFB, Illinois 62225-5302

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Robins AFB, Georgia 31098-1640

Chapter 1

Responsibilities and Cautions

RESPONSIBILITIES

1-1. Much of the damage to airdrop equipment and supplies occurs during derigging. Airdrop equipment must be derigged and recovered correctly to prevent damage to the fragile nylon airdrop items from cuts, water, and mildew; petroleum product contamination; and excessive exposure to sunlight. Recovery team personnel should be trained by parachute riggers (MOS 92R) prior to an airdrop operation. Riggers may be requested to assist the recovery OIC or NCOIC and to provide technical assistance. Riggers are not responsible for the recovery of airdrop equipment and supplies. The responsibilities for recovery are described below.

a. **THE COMMANDER OF THE RECEIVING UNIT.** The commander is responsible for appointing an OIC, NCOIC, or a supervisor. He is also responsible for organizing teams to recover the supplies and equipment, providing temporary storage if needed, and evacuating all airdrop rigging equipment.

b. **RECOVERY OIC OR NCOIC.** The recovery OIC or NCOIC is responsible for planning and supervising the operation. He supervises the teams needed to recover and evacuate all airdrop rigging equipment.

c. **THE RECEIVING UNIT.** The receiving unit should be capable of conducting the recovery. It is responsible for returning the airdrop equipment to the unit to which it belongs in proper condition as detailed in this manual. The unit can be held accountable for damage to the airdrop equipment as a result of negligence or failure to follow the procedures in this manual.

CAUTIONS

1-2. A majority of airdrop equipment is made of nylon. Nylon is subject to being degraded by sunlight and some types of artificial lighting. Exposure to sunlight, especially for parachutes, must be minimized. Petroleum products such as diesel fuel, gasoline, grease, and oil also have a degrading effect on nylon. Nylon airdrop items may fail or lose strength if they are contaminated with petroleum products. Airdrop equipment systems generally do not require knives for recovery and derigging. If nylon, dacron, or rayon airdrop items are immersed in salt water, they must be evacuated immediately. They should also be rinsed within 48 hours, under the supervision of a qualified parachute rigger, to avoid the possibility of having to condemn the equipment. In the process of recovery, especially in arid climates, exercise caution when recovering airdrop equipment, particularly parachutes. Also small creatures, such as snakes and insects (some poisonous), often seek shelter in the equipment, and they may be evacuated with the airdrop equipment. Take extreme care when recovering damaged airdrop loads containing hazardous materials (ammunition, pyrotechnics, and similar items). The Extraction Parachute Jettison Device (EPJD) contains an explosive squib, Hazard Class Division 1.4S. Extreme caution must be taken when handling this device. Notify Explosive Ordnance Disposal (EOD) personnel before recovery of damaged airdrop loads containing hazardous materials.

Chapter 2

Airdrop Rigging Components

GENERAL

2-1. Airdrop loads require special rigging equipment for delivery to a designated area. The type and size of the load to be delivered in airdrop containers or on airdrop platforms determines the quantity of equipment required. Basic airdrop rigging components are described in this chapter and in FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5, FM 10-500-3/FMFM 7-47/TO 13C7-1-11, or FM 4-20.105/TO 13C7-1-51.

TYPES OF PLATFORMS

2-2. Type of airdrop platforms commonly used are shown in Figure 2-1.

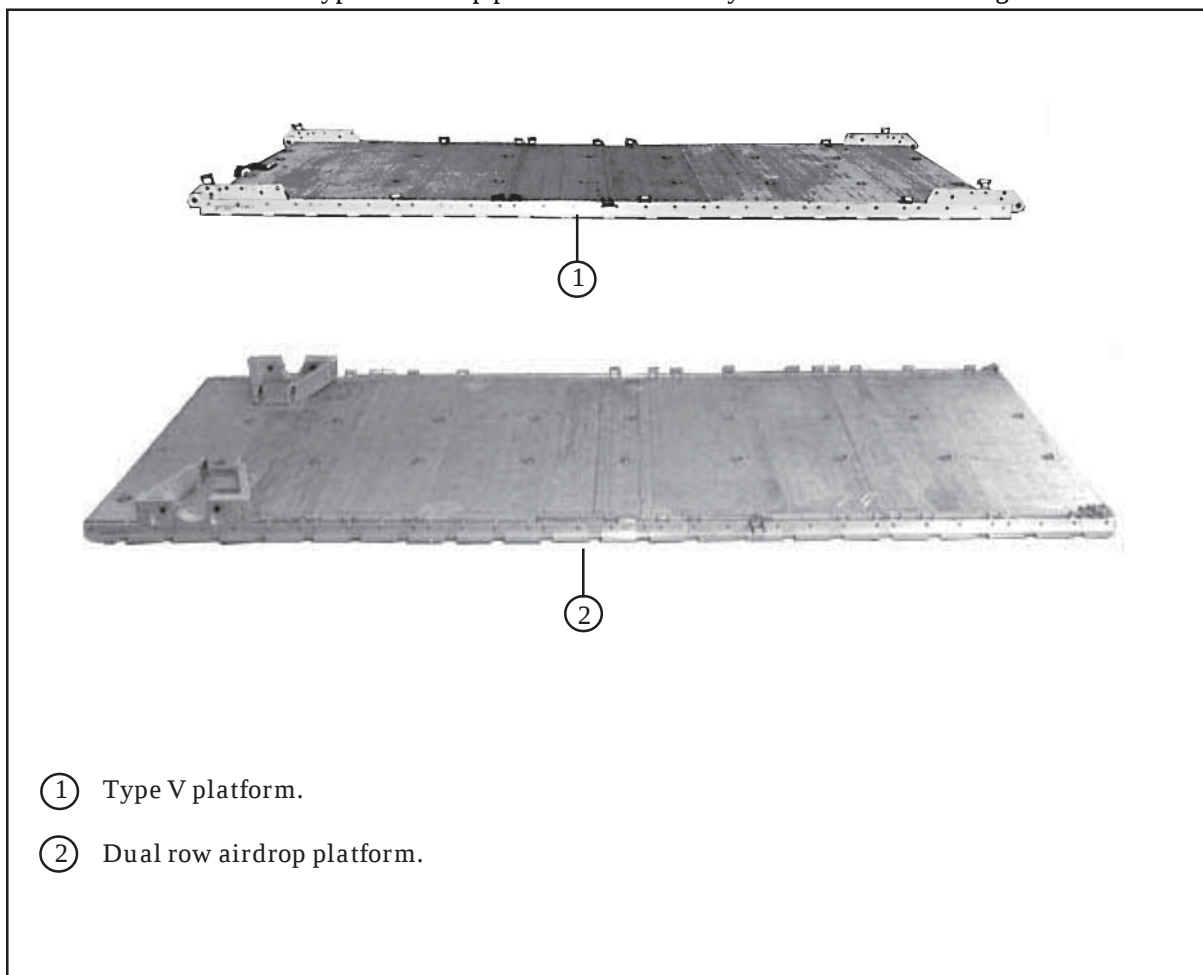


Figure 2-1. Airdrop Platforms

OUTRIGGER ASSEMBLY

2-3. An outrigger assembly is used on every dual row airdrop system (DRAS) load and some type V platform loads to help prevent the load from turning over after landing on the ground. The assembly is attached to the platform and is deployed from the vertical to the horizontal position after the load clears the ramp of the aircraft. The component parts of the outrigger assembly are shown in Figure 2-2.

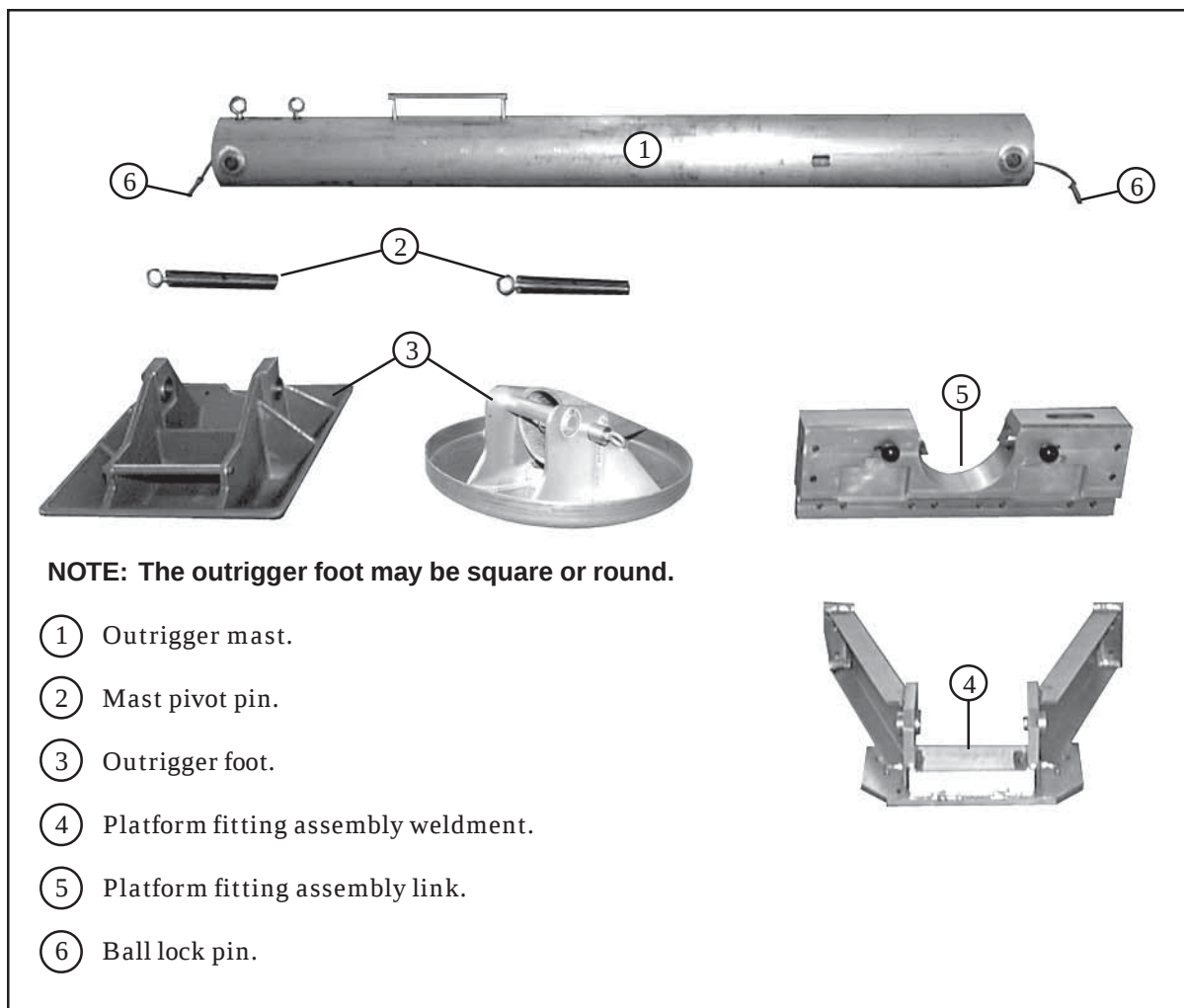


Figure 2-2. Components of Outrigger Assembly

CARGO SLINGS

2-4. Cargo slings are used for various purposes such as deployment or extraction lines, suspension or lifting slings, and riser extensions. The slings are available in 3-, 9-, 11-, 12-, 16-, 20-, 120-, 140-, and 160- foot lengths and are shown in Figure 2-3.

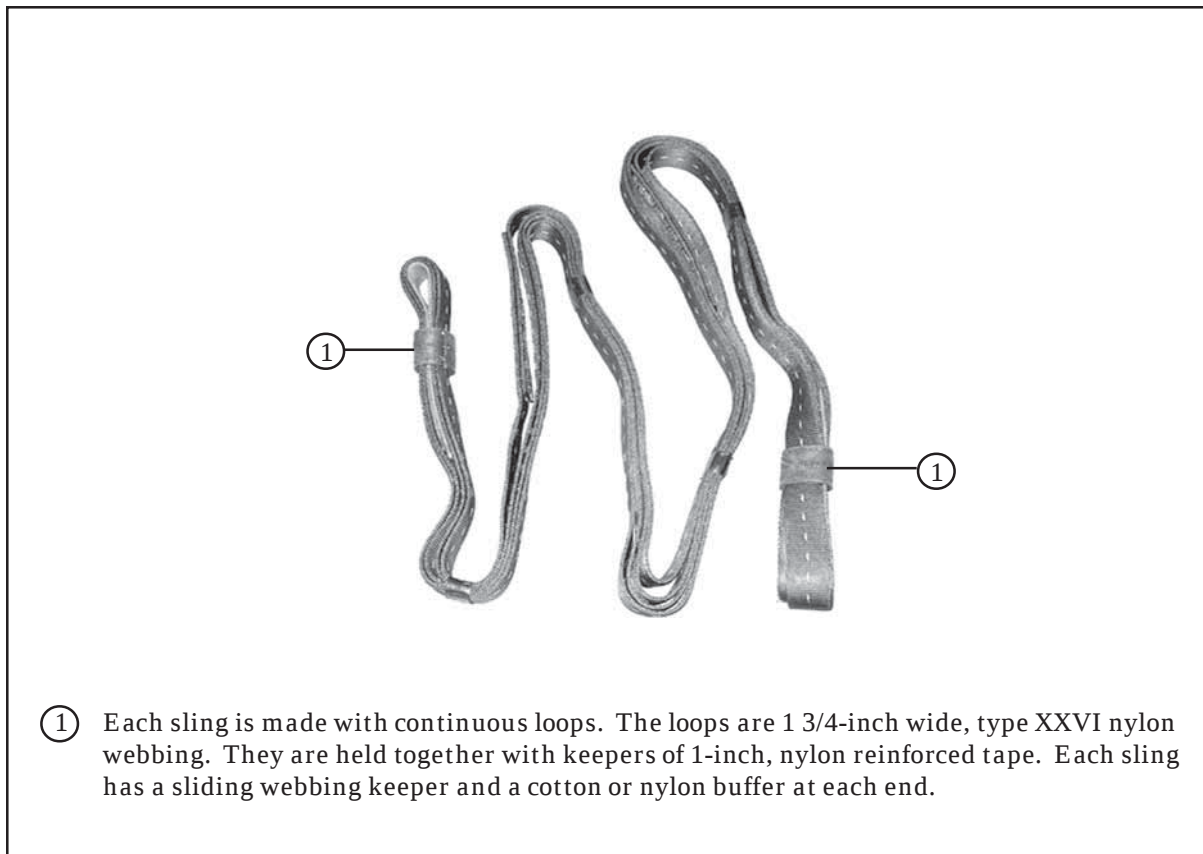
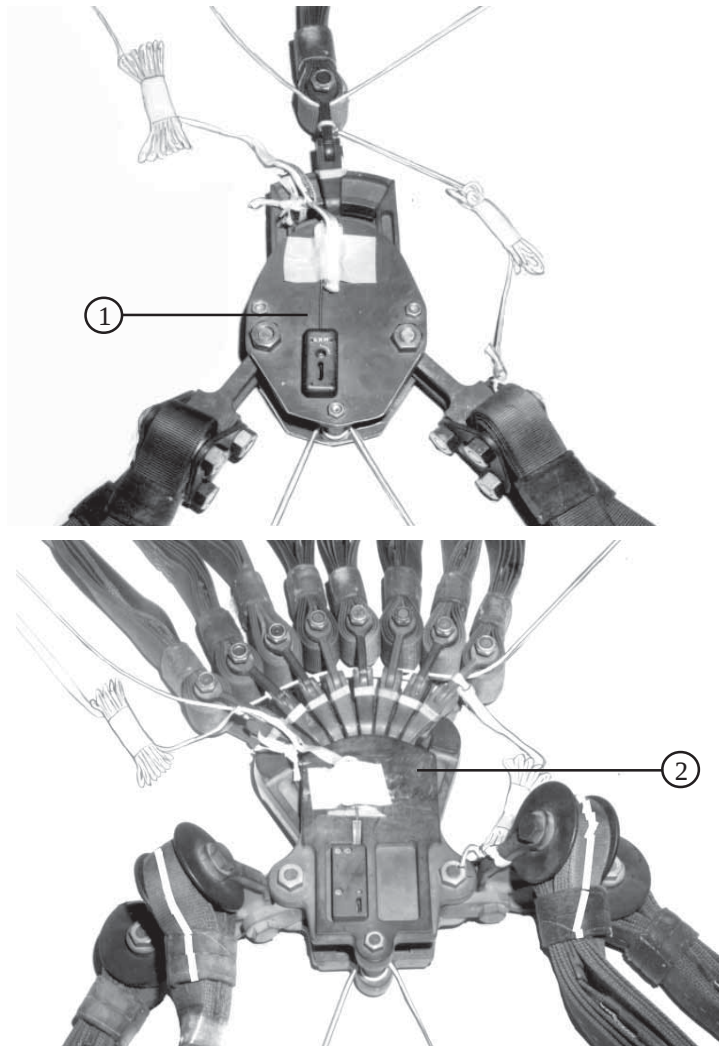


Figure 2-3. Cargo Slings

CARGO PARACHUTE RELEASE ASSEMBLIES

2-5. Cargo parachute release assemblies are mechanical devices designed to free the cargo parachute automatically when the airdrop load reaches the ground. The assemblies and components are shown in Figure 2-4.



- ① The M-1 cargo parachute release is used on loads weighing up to 15,000 pounds suspended weight.
- ② The M-2 cargo parachute release is used on loads weighing up to 42,000 pounds suspended weight.

Figure 2-4. Parachute Release Assemblies

LINK ASSEMBLIES

2-6. Link assemblies, shown in Figure 2-5, are used to join cargo slings in forming suspension slings and riser extensions of a desired length. They are used also in forming the extraction system.

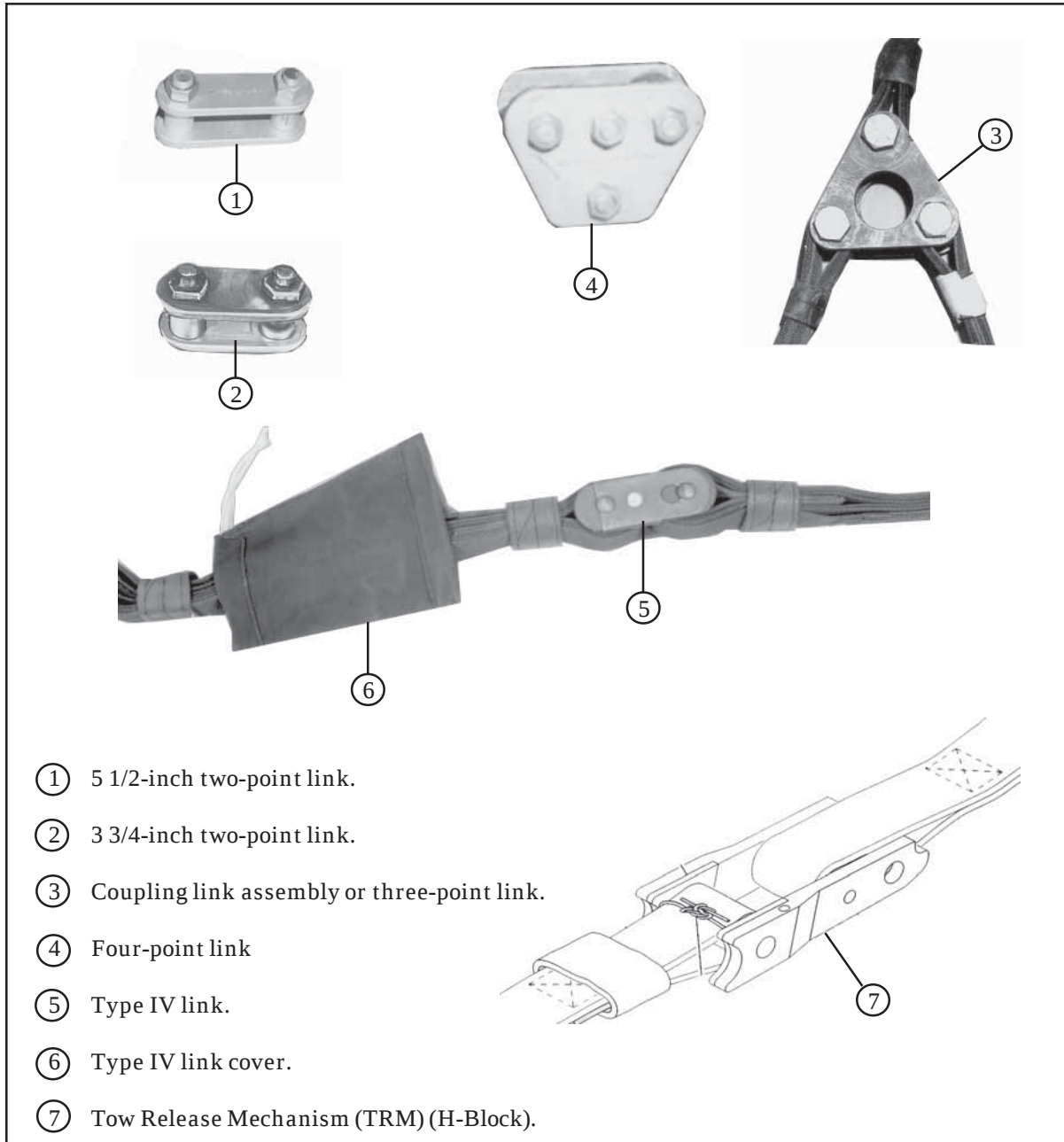


Figure 2-5. Link Assemblies and Link Cover

CLEVIS ASSEMBLIES

2-7. Clevis assemblies, shown in Figure 2-6, are used in grouping cargo parachute bridles, and attaching slings and parachute release assemblies. They are also used for purposes specified in the manual covering the rigging procedures for individual platform loads.

COVERS

2-8. Link and clevis covers are used to prevent metal-to-metal contact which may cause damage as shown in Figures 2-5 and 2-6.

MODIFICATION HARDWARE ITEMS

2-9. Hardware items made of metal are used to modify certain airdrop items as specified in the manual covering the rigging procedures of an individual airdrop load.

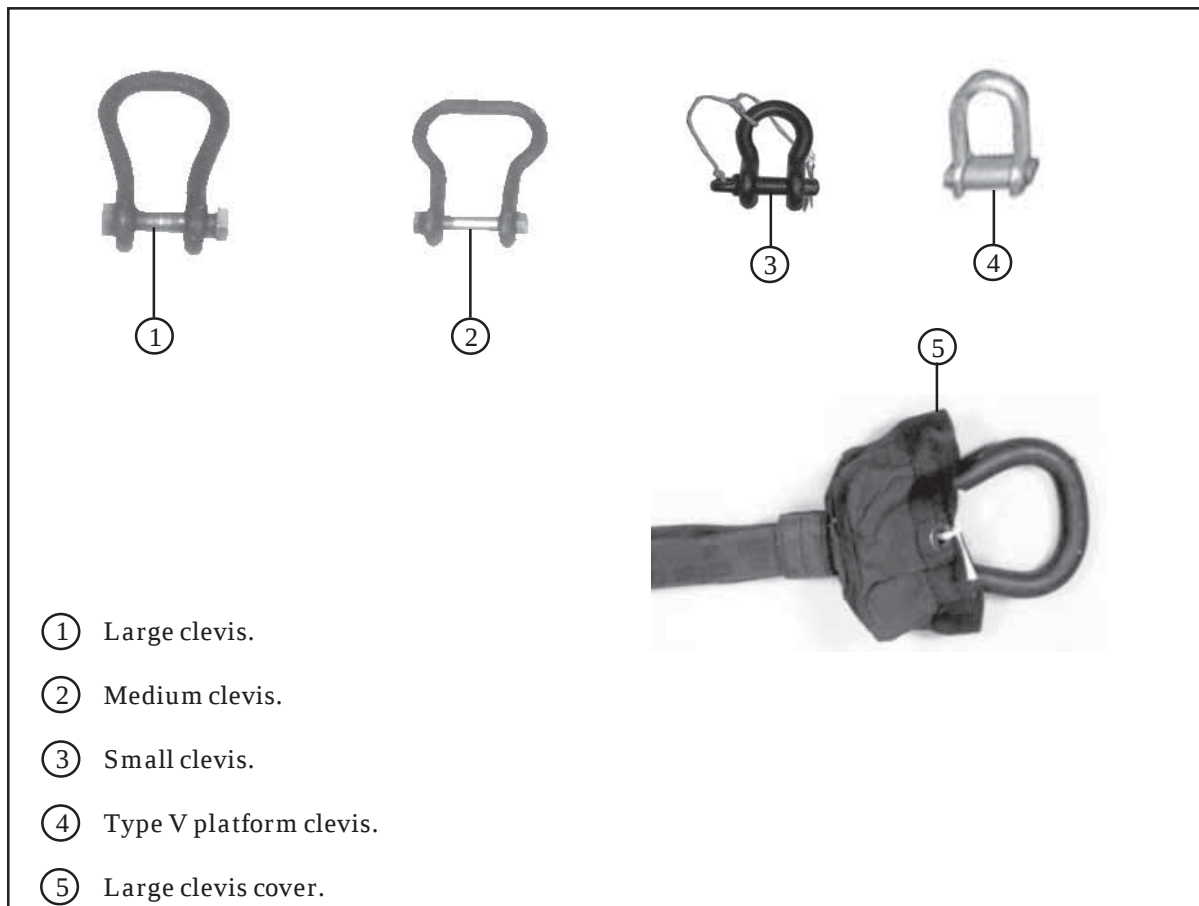


Figure 2-6. Clevis Assemblies and Clevis Cover

COMMON HARDWARE ITEMS

2-10. Common hardware items made of metal are used in rigging airdrop loads as specified in the manual covering the rigging procedures. Some common hardware items are shown in Figure 2-7.

CARGO COVERS

2-11. Covers and tarpaulins are commonly used to protect and secure loads of supplies and equipment rigged on airdrop platforms.

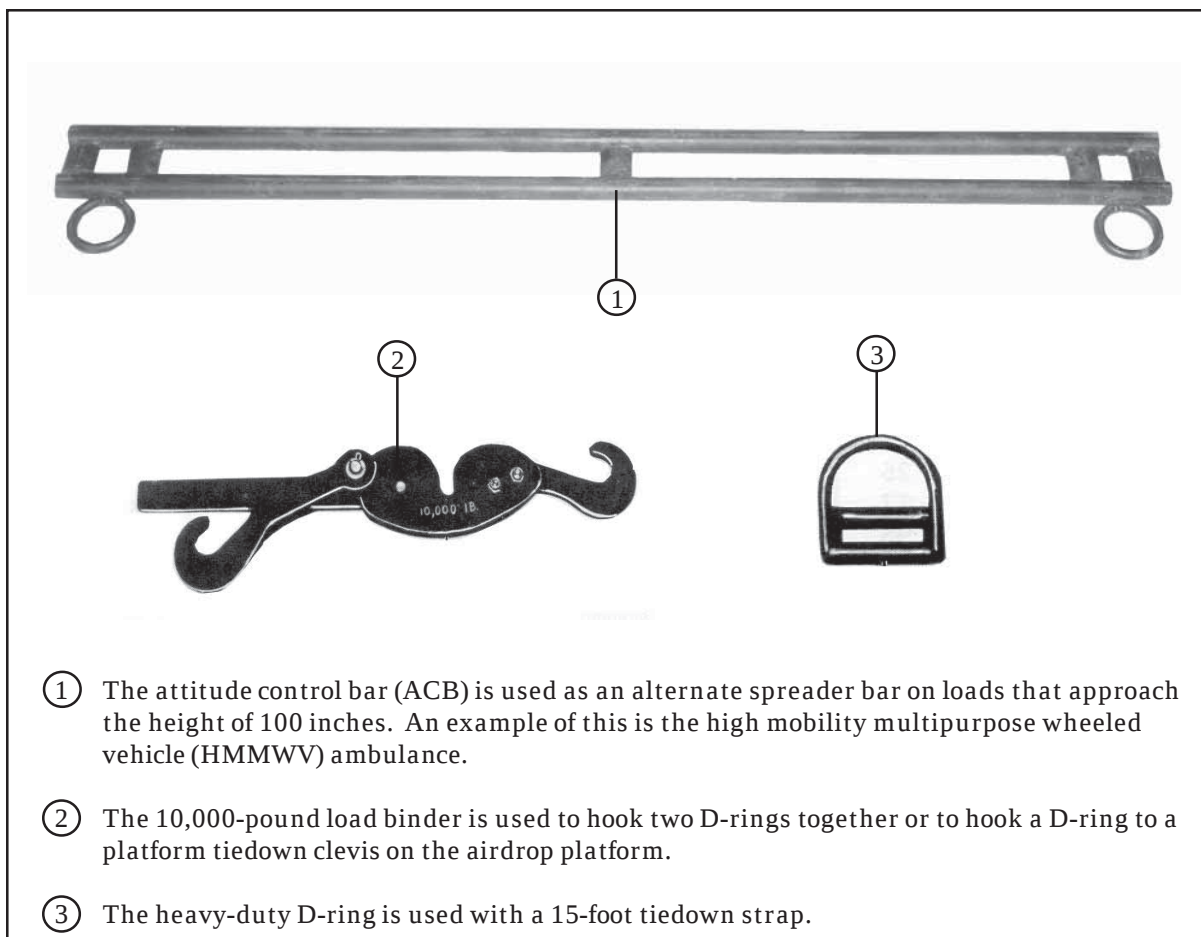


Figure 2-7. Common Hardware Items

HEAVY DROP DERIGGING SYSTEM

2-12. The heavy drop derigging system (HDDS), shown in Figure 2-8, may be used with the HMMWV, 2 1/2-ton truck and the 5-ton, 900-series truck. The HDDS wraps around the wheel of the vehicle and is used to assist a vehicle to clear the honeycomb and platform.

STRAPS AND WEBBING

2-13. Straps and webbing, shown in Figure 2-9, are used for lashing the load to the platform, suspending the load as specified in the manual covering the rigging procedures of an individual platform or container load, for restraining the load or parachute, and for parachute release with knife and strap system.

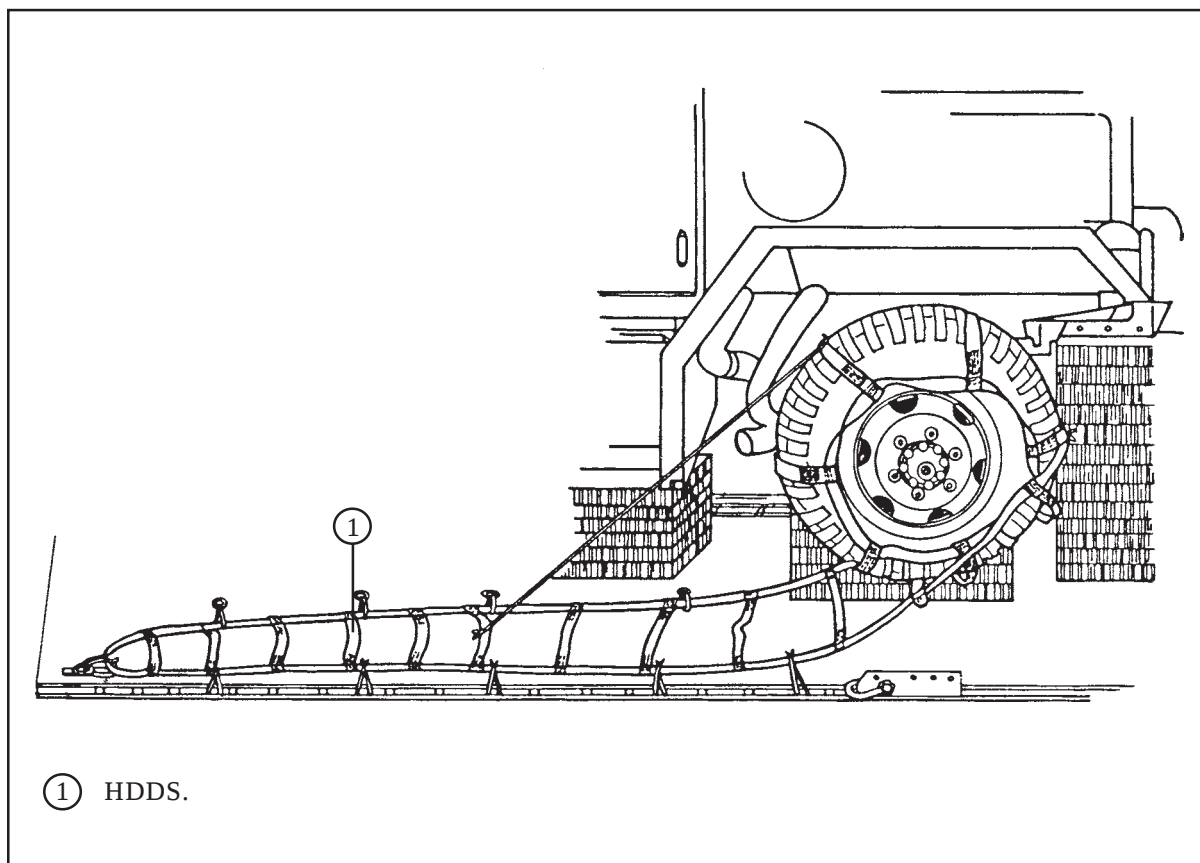


Figure 2-8. Heavy Drop Derigging System

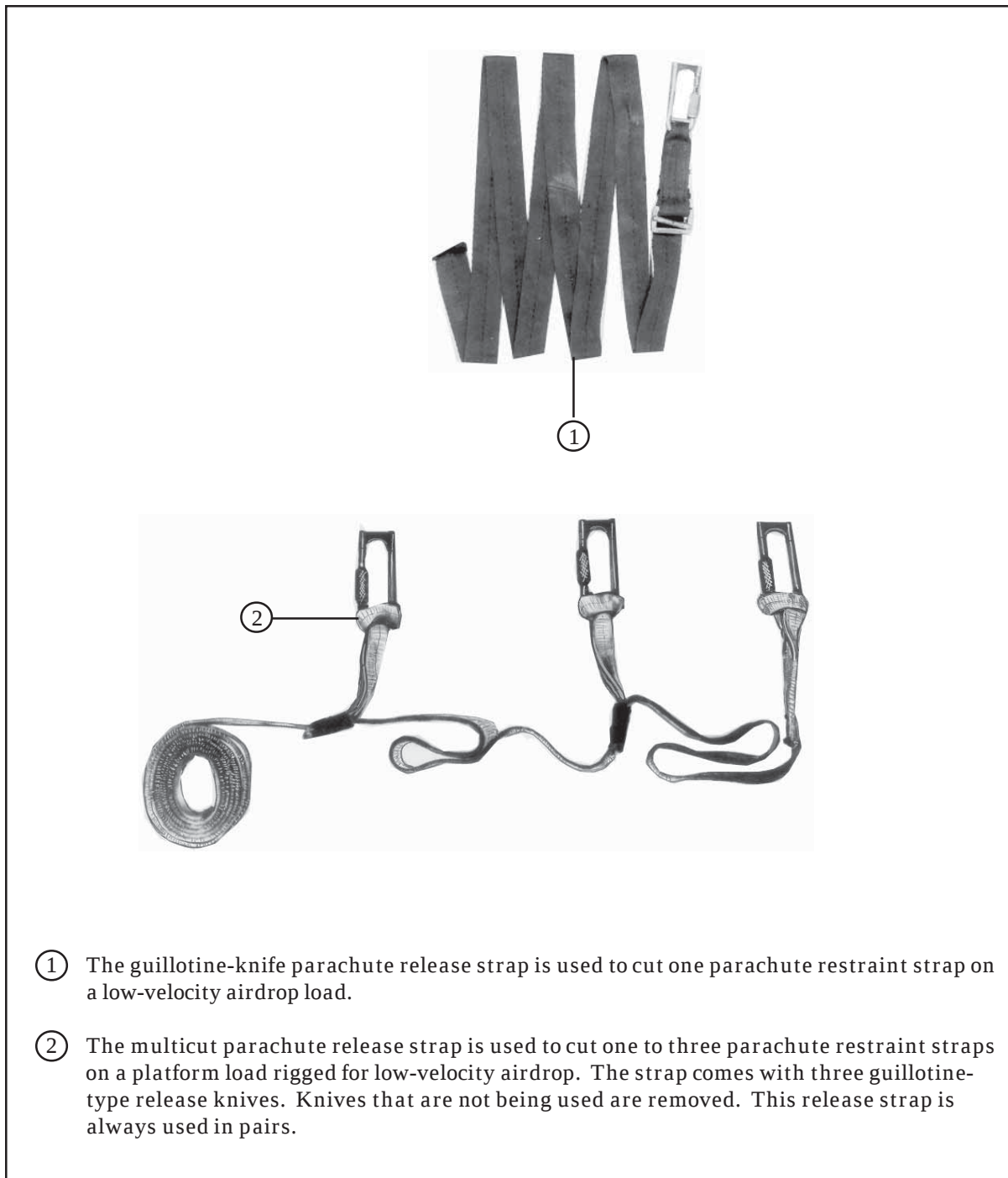


Figure 2-9. Straps and Webbing

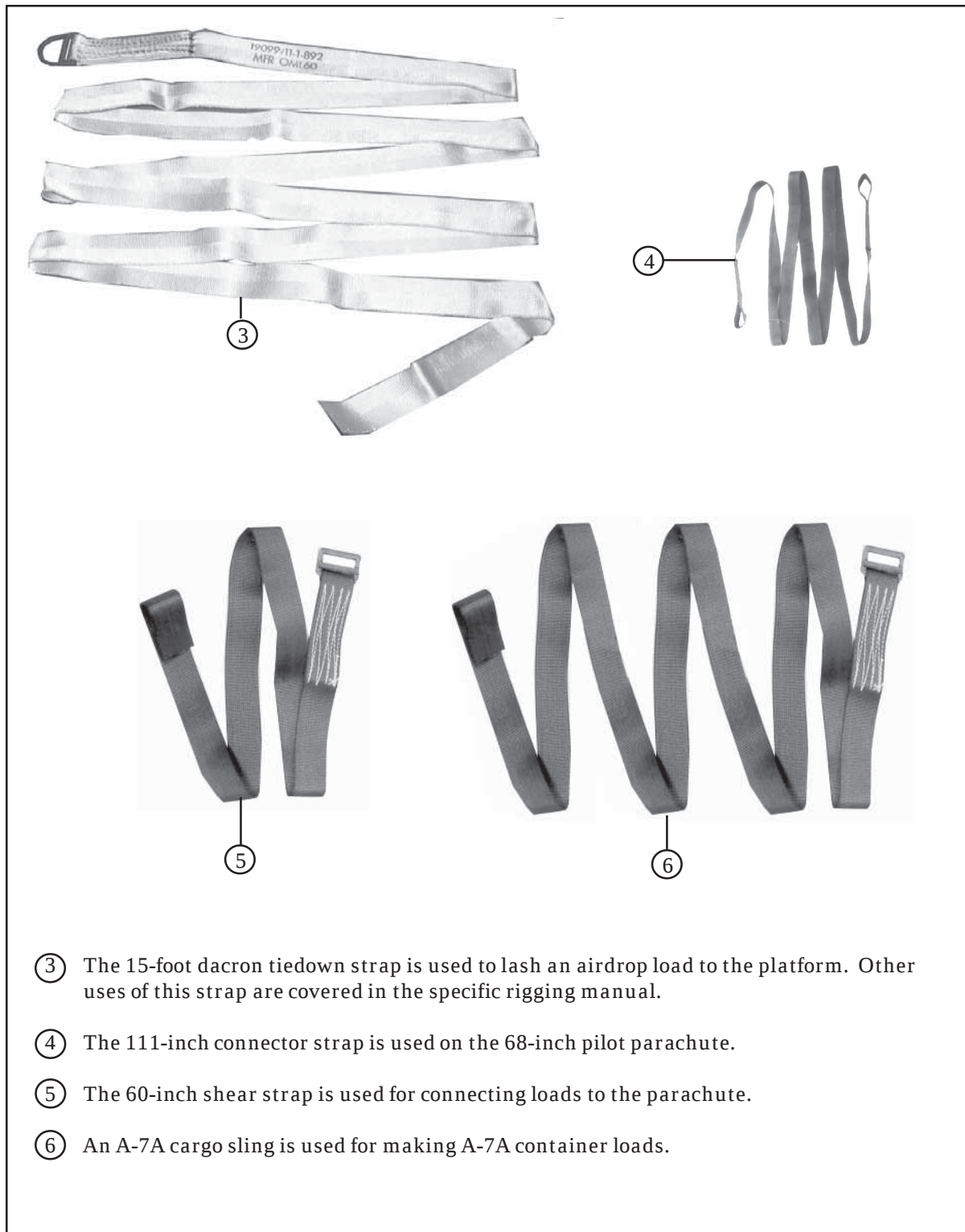


Figure 2-9. Straps and Webbing (Continued)

EXTRACTION FORCE TRANSFER COUPLING (EFTC)

2-14. The EFTC is the extraction system that is connected to the platform and is used to pull the load from the aircraft. The components of the EFTC are shown in Figure 2-10.

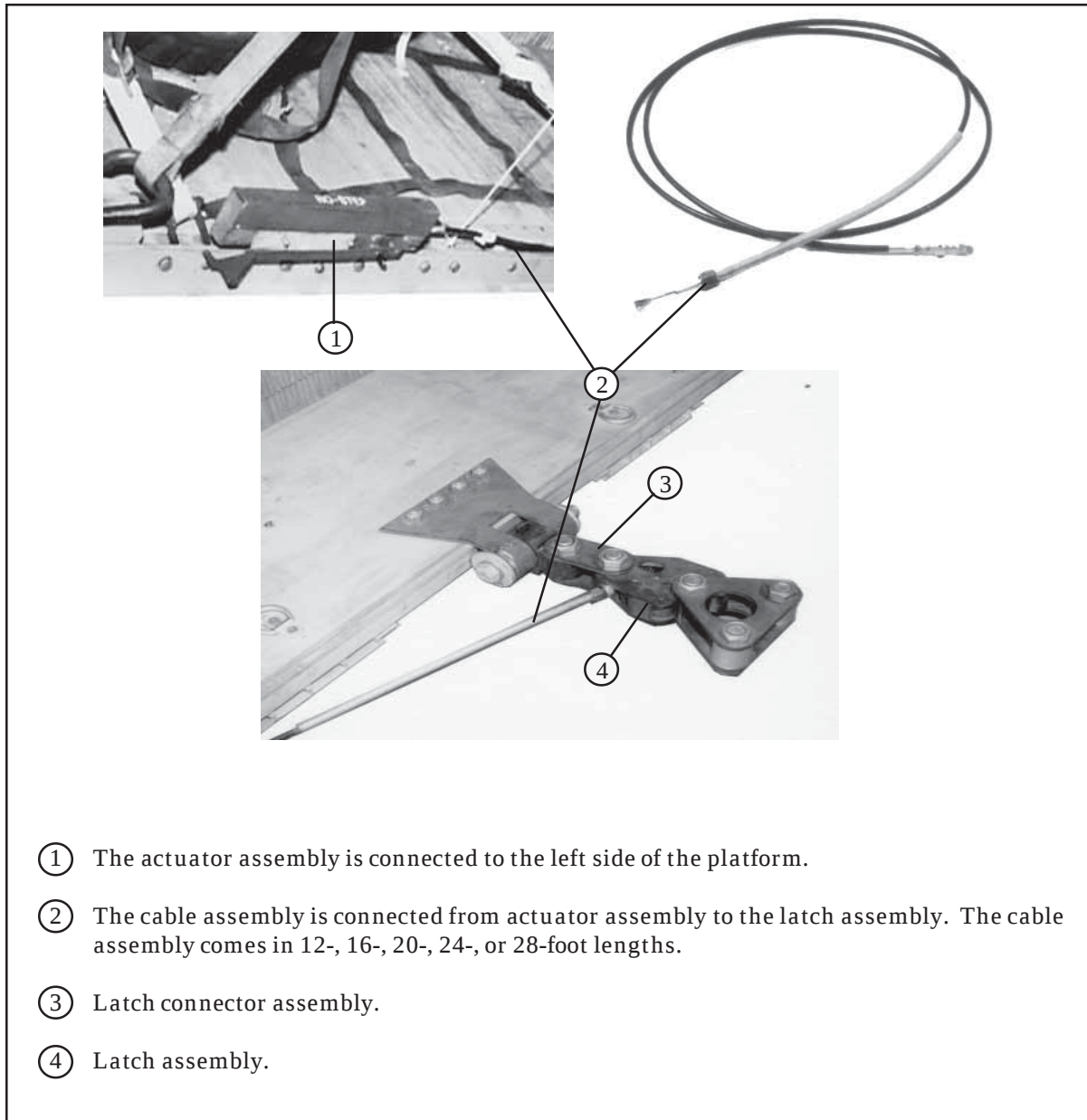


Figure 2-10. Components of the EFTC

EXTRACTION PARACHUTE JETTISON SYSTEM (EPJS)

2-15. The extraction parachute jettison system (EPJS) allows jettisoning of an extraction parachute during an extraction malfunction. The recoverable components of the EPJS will be connected to the three-point link connected to the extraction parachutes. The components recovered from the DZ are shown in Figure 2-11.

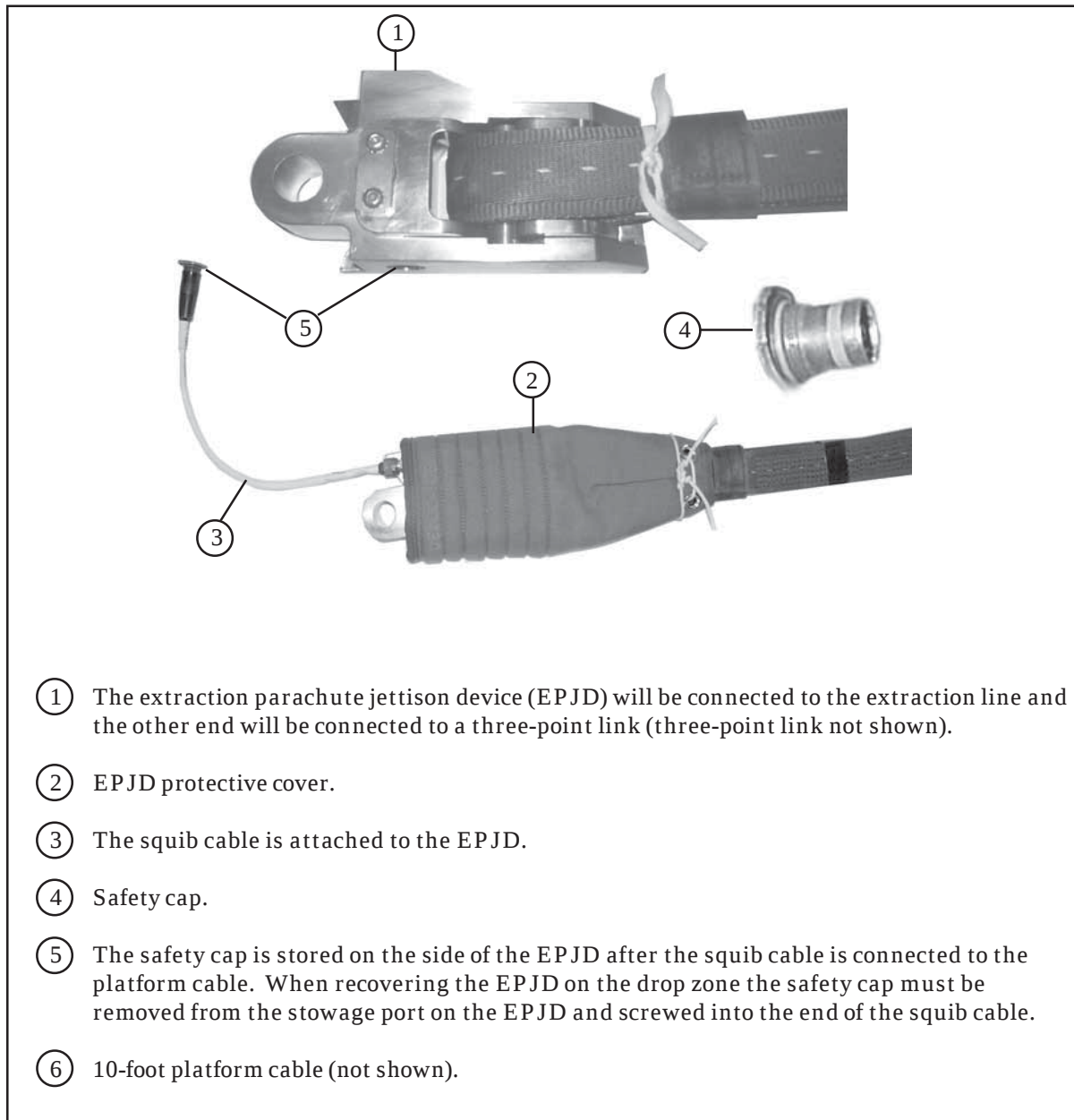


Figure 2-11. Components of the EPJS

Chapter 3

Airdrop Derigging Procedures

GENERAL

3-1. Much of the damage to airdrop equipment occurs during derigging. Follow specific procedures to prevent unnecessary damage and loss of vital airdrop equipment. Derigging procedures and special tools needed for the derigging of airdrop loads are described in this chapter.

AIRDROP PLATFORM LOAD DERIGGING PROCEDURES

3-2. Derigging procedures consist primarily of removing the basic components of the rigging equipment from the load so that the airdrop items may be moved quickly from the drop zone and put into use. For reasons of supply economy, ensure that the airdrop rigging equipment is removed properly during derigging.

- a. **REMOVING SUSPENSION GROUPS.** The derigging of the suspension group includes removal of the suspension slings from the parachute release and any other items of equipment which connects the suspension slings to the load or cargo parachutes. Remove the rigging equipment as outlined in Figure 3-1.

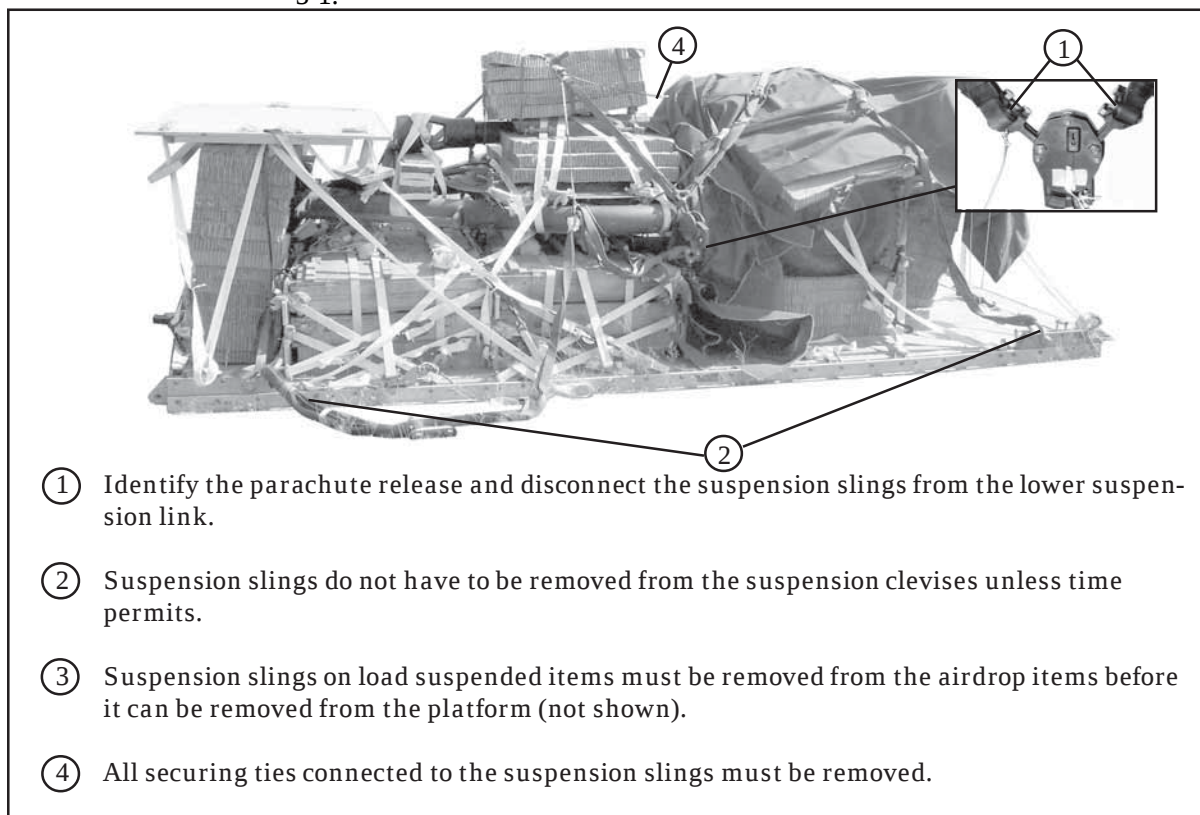


Figure 3-1. Suspension Line Groups Derigged

b. **REMOVING TIEDOWN ASSEMBLY.** The derigging of the tiedown assembly includes removal of the tiedown lashings and load binders. When the load is rigged, the tiedown lashings and the load binder or ratchet tiedowns, which secure the load to the airdrop platform, are extremely tight. However, after the loads hit the ground, the tiedown lashings are usually loose enough to be removed easily. Tiedown straps and load binders that are still under tension must be removed as shown in Figure 3-2.

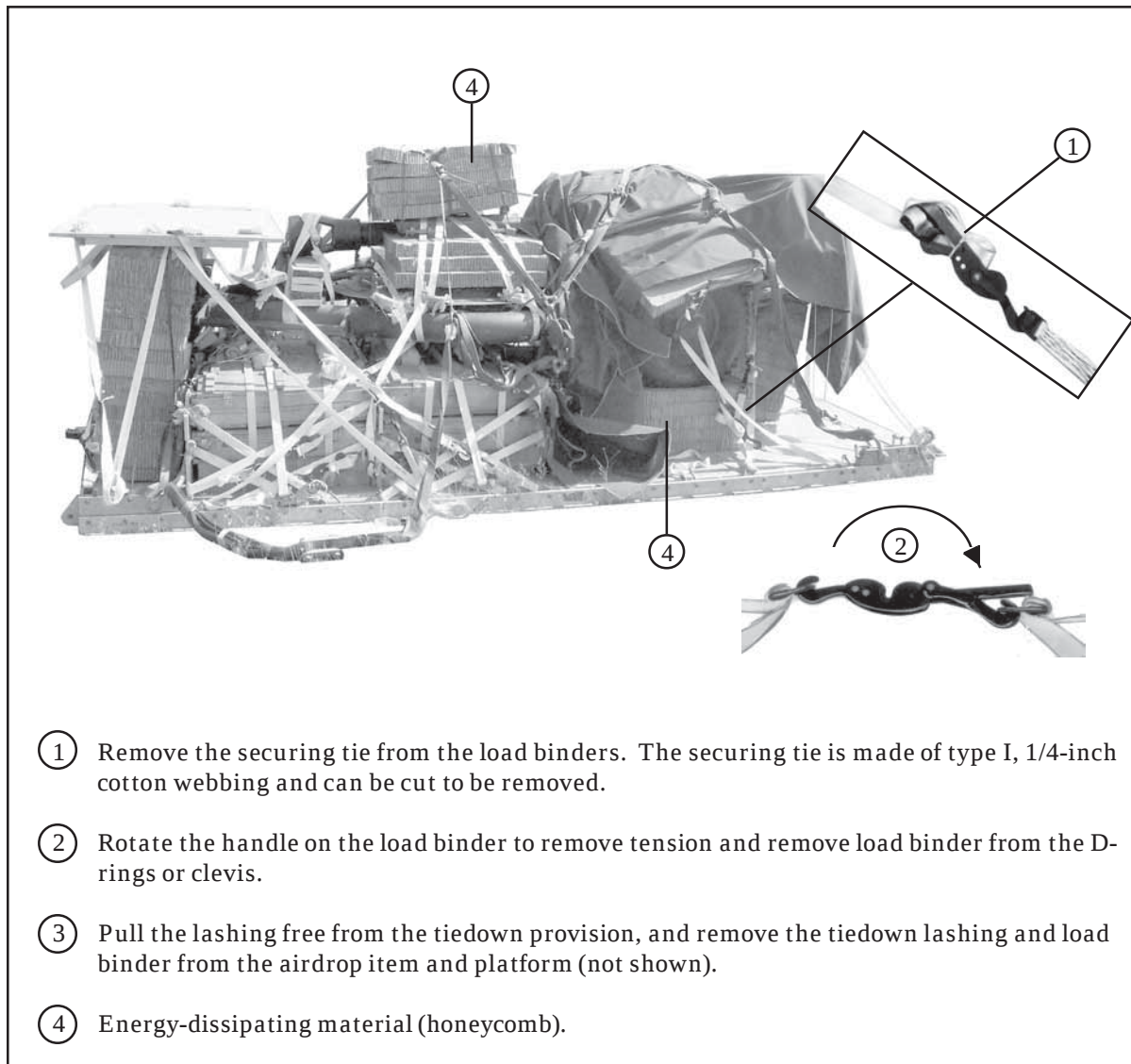


Figure 3-2. Tiedown Assembly Removed

c. **REMOVING ACCOMPANYING LOAD.** When an accompanying load and/or related airdrop equipment is used, remove the tiedown assembly in the same manner as described in Figure 3-2. Remove the accompanying load and/or related airdrop equipment from the airdrop item or platform.

d. **REMOVING ENERGY-DISSIPATING MATERIAL.** The energy-dissipating material (honeycomb) is used to absorb the shock of landing. On most loads, the honeycomb can be kicked free from the airdrop item or the item can be driven or towed off the platform. Honeycomb is shown in Figure 3-2.

e. **REMOVING THE EFTC.** Remove the EFTC components as shown in Figure 3-3.

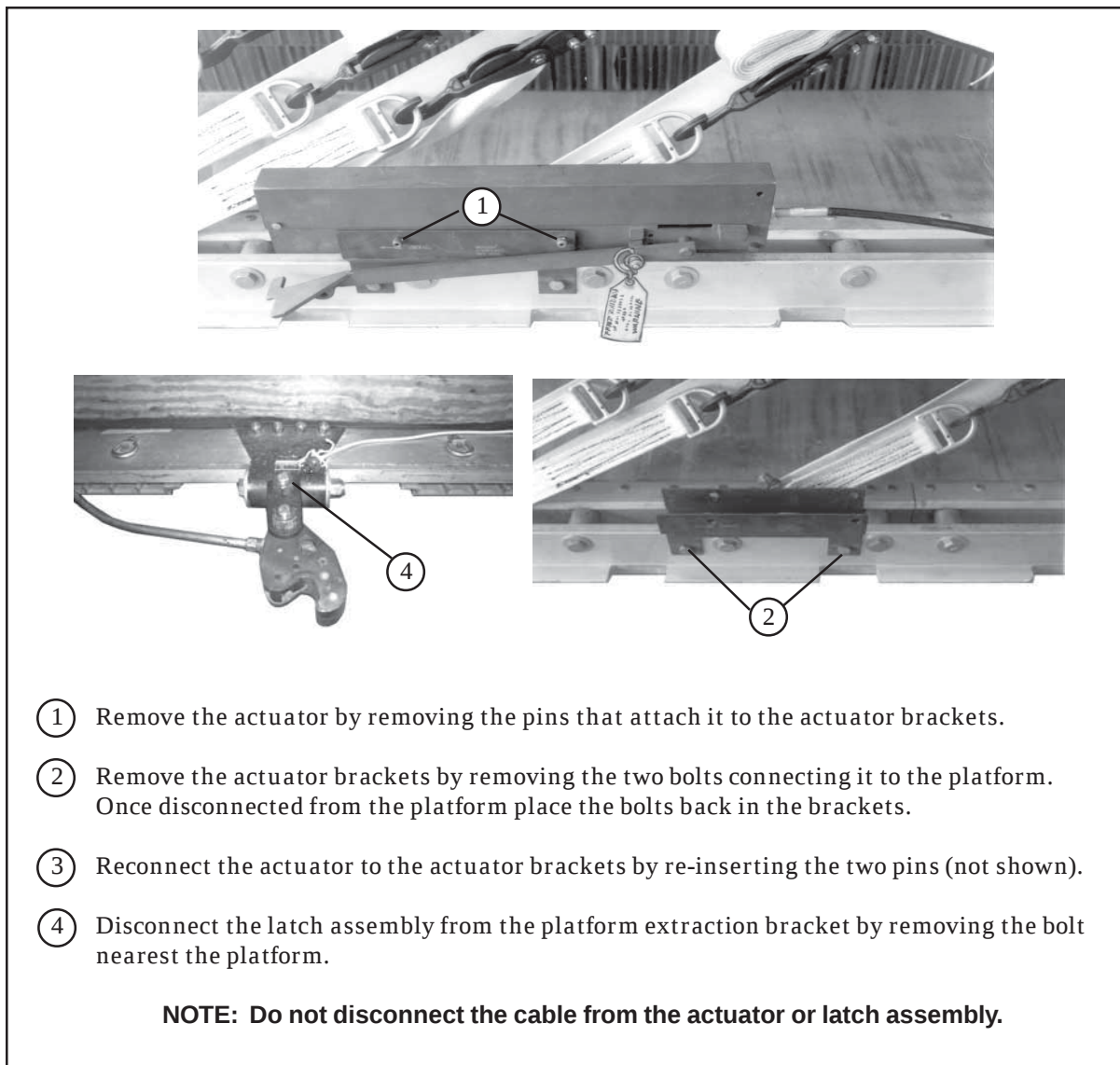


Figure 3-3. EFTC Components Removed

f. **REMOVING MISCELLANEOUS ITEMS.** The following list of items should be derigged and replaced or removed as necessary and as time and need permits. Some of the items may have to be removed after the vehicle is removed from the platform.

- (1) EPJS platform cable.
- (2) Parachute stowage platform.
- (3) Gasoline tank support strap.
- (4) Tarpaulin and bows.
- (5) Towing tongue.
- (6) Gasoline cans.
- (7) Windshield protector.

g. **REMOVING VEHICLE WITH THE HEAVY DROP DERIGGING SYSTEM (HDDS).** The HDDS is an upgraded version of the drive-off aid. It can be used with the HMMWV, 2 1/2-ton truck, and the 5-ton, 900-series truck. Once the tiedown assemblies are removed, the vehicle, when powered up, will progressively wrap the webbed ladder around the wheels and pull itself clear of the honeycomb. Drive the vehicle only enough to free it from the honeycomb so the vehicle will be able to move under its own traction. Stop the vehicle, place it in a neutral gear, and engage the emergency brake. Carefully remove all loose honeycomb and wooden items. Release the emergency brake and carefully drive the vehicle onto the platform, then slowly unwrap the HDDS from the wheels, thus separating the vehicle from the platform.

CAUTION

1. The wheels with the HDDS installed must not be driven clear of the end of the platform.
2. Do not spin the wheels of the vehicle. If the honeycomb is not completely collapsed, the friction can ignite the paper of the honeycomb or melt the nylon webbing of the HDDS ladder.
3. The HDDS can slip off the wheel and wrap around the axle if the vehicle is not driven off straight.
4. The HDDS ladder can hang in the wheel lugs and cause damage.
5. The 900-series 5-ton truck will be seriously damaged if operated in low-range, all-wheel-drive, reverse gear. See operator caution on the dashboard and the operator's manual.

h. REMOVING THE DEPLOYABLE OUTRIGGERS FROM PLATFORM. Remove the deployable outriggers from the platform as outlined in Figure 3-4.

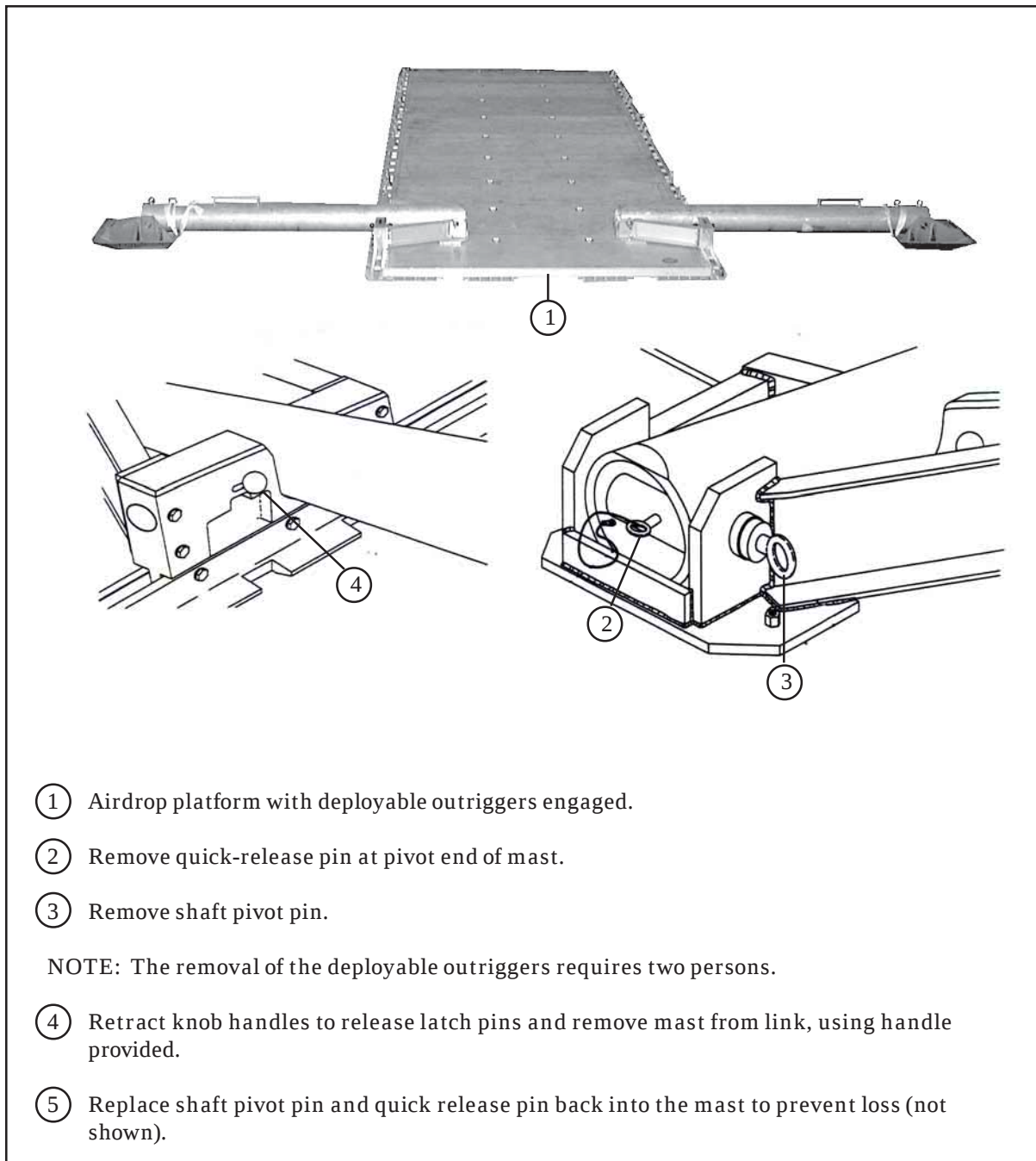


Figure 3-4. Deployable Outriggers Removed from Platform

AIRDROP CONTAINER LOAD DERIGGING PROCEDURES

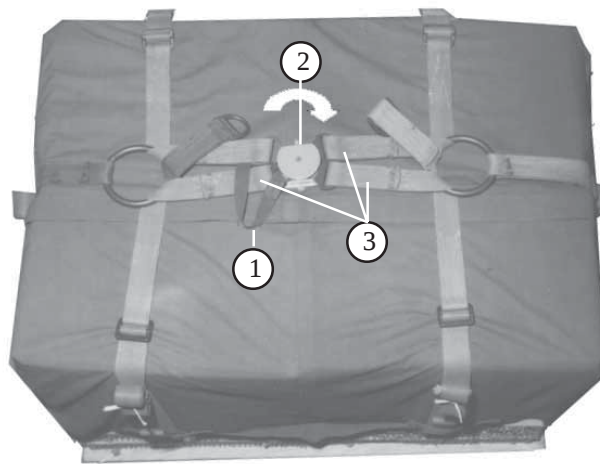
3-3. Airdrop containers consist of the A-7A cargo sling, A-21 cargo bag, and the A-22-series cargo bag. The following procedures are used to derig a container load:

a. **DISCONNECTING CARGO PARACHUTES.** To disconnect the 68-inch pilot, G-14 cargo, and 15-foot extraction parachutes from the A-7A cargo sling or A-21 cargo bag, disconnect the parachute risers from the D-rings, and remove the cargo parachutes from the containers. The G-12, G-14 cargo, 26-foot high-velocity, and 22-foot extraction parachutes are used on the A-22 cargo bag. Disconnect the cargo clevis from the suspension webs, and remove the cargo parachute.

b. **UNPACKING AIRDROP CONTAINERS.**

(1) **A-7A Cargo Sling.** Remove the tape or type I, 1/4-inch cotton webbing on sling strap folds. Loosen and pull all sling straps from strap fasteners. Lay the sling straps on the ground, and remove the load from the cargo slings.

(2) **A-21 Cargo Bag.** Derig the A-21 cargo bag as shown in Figure 3-5.



- ① Remove the safety clip.
- ② Twist the outer rotating disc clockwise on the quick-release assembly and press down.
- ③ Remove the quick-release straps from the quick-release assembly and pull them through the O-ring.
- ④ Remove the cover from the load (not shown).

Figure 3-5. A-21 Cargo Bag Derigged

(3) **A-22 Cargo Bag.** Derig the A-22 cargo bag as shown in Figure 3-6.

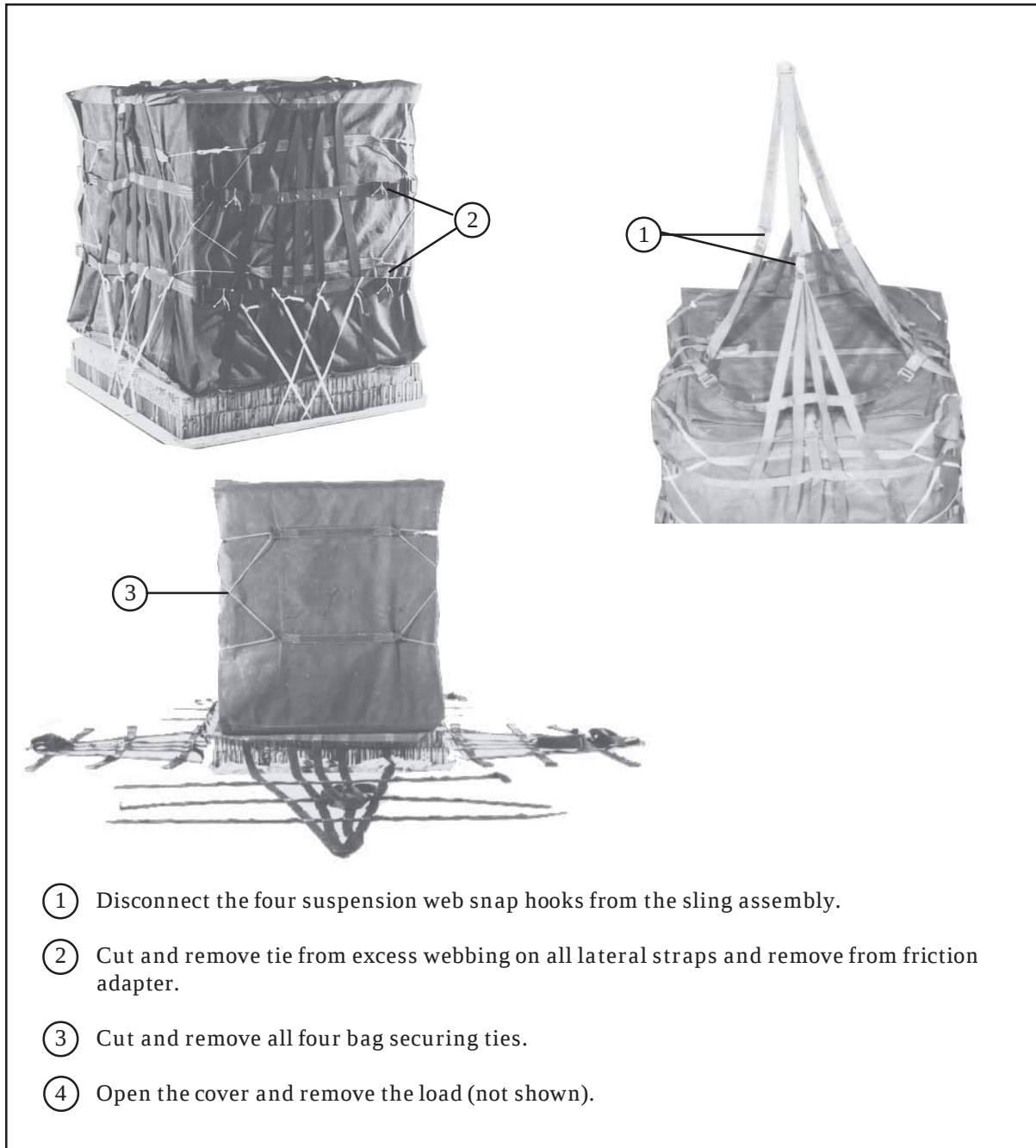


Figure 3-6. A-22 Cargo Bag Derigged

TOOLS USED FOR DERIGGING

3-4. Table 3-1 shows a suggested list of tools and equipment. This is neither a mandatory list nor a complete list. It is only intended to help you select a minimum number of tools to be included in a derigging and recovery tool kit, if needed. Tree climbing and cutting equipment may also be included for use on loads that land in the trees.

Table 3-1. Suggested Tools for Derigging

Quantity	Nomenclature	Use
1	*Knife	As required
1	Screwdriver, flat-tip (large)	Parachute release
1	Screwdriver, flat-tip (medium)	Connector link
1	Adjustable wrench (10-inch)	As required
2	1 1/2-inch wrench, combination	Large clevis EFTC link assembly adapter Two-point link
2	1 7/16-inch wrench, combination	Two-point link
2	1 1/8-inch wrench, combination	Medium clevis
1	1-inch wrench, combination	Parachute release
2	5/8-inch wrench, combination	Type V clevis
2	9/16-inch wrench, combination	EFTA bracket Type II clevis
1	Tin snips	Steel banding
1	Hammer	As required
As required	Heavy duty plastic bags	Parachutes and trash
*Do not cut lashings, straps, parachute release arming wire and lanyards, or any other airdrop item. Use knives for cutting nylon or cotton webbing ties only.		

Chapter 4

Airdrop Equipment Recovery Procedures

SECTION I - PREPARATION FOR RECOVERY

GENERAL

4-1. Recovery procedures are designed to ensure, in the interest of supply economy, the maximum recovery of parachutes and related airdrop equipment used to deliver personnel, supplies, and equipment during aerial delivery operations.

PREPARATION FOR RECOVERY OPERATIONS

4-2. Preparation for recovery is vital to having a successful operation. Having the right equipment and being prepared will greatly enhance the recovery operation.

a. **RESPONSIBILITIES.** The commander of the receiving unit is responsible to appoint a recovery NCO or officer from within his own unit. The recovery NCO or officer plans and supervises the operation and organizes the needed teams to recover and evacuate parachutes and related airdrop equipment. The receiving unit should be capable of conducting the recovery according to this manual.

b. **PERSONNEL COORDINATIONS.** The success of the recovery mission depends on the support of the combat unit securing the perimeter, communication control to provide the evacuation of the mission in minimum time, and proper briefings of recovery personnel on the tactical situation. It depends also on the experience of available personnel on recovery teams, and available transportation. Coordination among the combat unit recovery officer, recovery supervisors, team personnel, and transportation is necessary for a successful recovery mission.

c. **SPECIAL CONSIDERATIONS.** Some special areas to consider are listed below.

(1) **Tactical Situation.** Prior to recovery operations, all personnel involved in the recovery must be briefed thoroughly on the tactical and alternate plans so they will be prepared for any contingencies that may occur.

(2) **Types of Terrain.** Recovery time and effort may be increased or decreased according to undergrowth, obstacles, and texture of the soil (such as mud and ruts).

(3) **Weather.** Recovery operations must be adjusted according to existing weather conditions.

(4) **Size and Number of Drop Zones.** The drop zone (DZ) may consist of a number of small drop zones over a large area, or it may consist of one or two large ones. The number of personnel and vehicles required for recovery depends on the area of the drop zone.

(5) **Quantity and Type of Equipment.** The quantity and type of equipment to be recovered is an important factor in overall recovery planning. Containers must be provided for packaging small, loose metal and fabric components (such as clevises, connector links, and load binders).

(6) **Communications.** Communication is needed between recovery team supervisors and the recovery officer and between the combat unit and the recovery officer in the event of possible changes in the tactical situation.

(7) **Technical Supervisions.** The recovery officer is responsible for acquiring the needed technical supervision according to the size and amount of supplies and equipment.

(8) **Equipment and Available Personnel.** The number and the type of equipment and the quantity of personnel available may affect recovery time.

(9) **Methods of Recovery and Evacuation.** The methods of recovery and evacuation of equipment depends on local conditions, available personnel, transportation, and the destination of the recovered equipment and supplies.

PRINCIPLES OF RECOVERY AND EVACUATION

4-3. Principles of recovery and evacuation include recovery planning factors, recovery priorities, recovery accountability, recovery plans and evacuation, transportation, and storage.

a. **GENERAL AIRDROP RECOVERY PLANNING FACTORS.** Airdrop equipment is expensive and in short supply. The unit receiving airdrop resupply must attempt to recover, protect, and retrograde this equipment. Receiving units must use aerial delivery recovery data to compute estimated quantities (volume/weight) of equipment to be retrograded. If the tactical situation prevents recovery, destroy the airdrop equipment according to TM 43-0002-1 to prevent enemy forces from using it. Prepare contingency plans for airdrops involving unusual or unforeseen circumstances where special techniques may have to be used. For example, plan what to do when drops occur off the drop zone or in trees, or when the receiving unit or part is not U.S. military or military of other nations.

b. **RECOVERY PRIORITIES.** Airdrop equipment should be recovered and evacuated in the following order of priority:

- (1) Personnel parachutes.
- (2) Cargo parachutes.
- (3) Airdrop containers.
- (4) Airdrop platforms.

(5) Related airdrop rigging equipment.

c. **RECOVERY ACCOUNTABILITY REPORTING.** Receiving units must turn in equipment to the supplying unit as quickly as possible. The turn-in must be within 48 hours, or sooner, to avoid possible damage from improper storage conditions and to speed the return of air items for future reuse. Units should establish, through standing operating procedures (SOP), how a receiving unit needs to report disposition of recovered items. Receiving units are responsible for equipment until it is delivered in proper condition to the supplying unit. Parachute riggers are not responsible for safeguarding and protecting air equipment from pilferage. Air items suspected of being damaged due to willful negligence or deliberate actions will be identified and segregated for disposition and determination of actions. Plans must also be made for the recovery and turn-in of residual air equipment on board the aircraft.

d. **RECOVERY PLANS.** Ensure requirements for the recovery of air items are met, as described below.

(1) **Plans, Including Major Factors.**

- (a) Plan for security of drop zone.
- (b) Plan for equipment recovery according to this manual.
- (c) Plan for recovery of items at airfield.
- (d) Plan for safeguarding of air items at airfield.
- (e) Plan for materials handling equipment (MHE) and transportation.
- (f) Plan for tree-cutting and climbing equipment.
- (g) Plan for segregation of air items by type prior to turn-in.

(2) **Preparations and Actions Prior to Airdrop.**

- (a) Designate and assign a team for recovery.
- (b) Organize, train, and brief recovery detail to ensure quick recovery of air equipment, or coordinate for parachute riggers to train team members prior to airdrop.
- (c) Ensure necessary derigging tools and recovery equipment are available.
- (d) Ensure tarpaulins or plastic bags are available in case of inclement weather.

(3) **Actions After Airdrop.**

- (a) Account for items issued but not delivered to the DZ.
- (b) Coordinate with individuals responsible for issue and recovery to determine shortages.

(c) Expedite turn-in of all air items, and resolve all shortages immediately.

e. **EVACUATION, TRANSPORTATION, AND STORAGE.** The recovery NCOIC or OIC supervises the evacuation of parachutes and related airdrop equipment from the drop zone to the central and/or rear area, depending on the tactical situation. Available transportation will be used for evacuation. Sling loading of airdrop loads by helicopter is an optional means of transport. Transportation used for air items will be inspected prior to loading items. Vehicles must have clean, dry cargo beds and sufficient tarpaulins or plastic to protect air equipment from inclement weather or contamination. The recovery units are responsible for preventing air items from becoming contaminated by fuels, such as diesel or oil, in vehicle beds. Parachutes need special attention to keep them from becoming soiled or wet. Clean air items should be segregated from contaminated items to keep from spreading the contamination. Air items should be placed into plastic bags to prevent contamination from fuel, dirt, and water. Ensure transport vehicles are equipped with adequate means to secure platforms to the vehicle, such as chains or tiedown straps. When evacuation is by ground, receiving units should provide a guard detail to accompany each load to prevent sabotage or pilferage enroute. Under all conditions, ensure evacuation as rapidly and directly as possible, since additional airdrop of supplies and equipment may depend upon the availability of parachutes and related airdrop rigging equipment.

SECTION II - RECOVERY OF AIRDROP EQUIPMENT ON THE DROP ZONE

RECOVERY PROCEDURES

4-4. Recovery procedures are as follows:

a. **PROHIBITED ACTIONS.** The following actions are prohibited:

- (1) Do not drag personnel parachutes or cargo parachutes from trees, obstructions, or along the ground during recovery.
- (2) Do not cut parachute suspension lines to aid recovery unless all other efforts fail.
- (3) Do not drag aerial delivery platforms and related equipment across the ground to speed recovery.
- (4) Do not cut or use the arming wire and lanyard of the M-1 or M-2 parachute release assembly to speed recovery. Remove the arming wire and lanyard from the cargo parachute deployment bag, and tie them to the release.
- (5) Do not disassemble the release assembly body when removing suspension slings. Once the suspension slings are removed, place the suspension link bolts and spacers back on the assembly.
- (6) Do not empty ballast sand boxes on the drop zone.

(7) Do not stack airdrop platforms without two layers of honeycomb, or dunnage between each platform to prevent damage caused by metal-to-metal contact.

(8) Do not disassemble the EPJD.

(9) Do not cut EPJS platform or squib cables.

b. HEAVY CARGO PARACHUTES.

(1) Recovery of Cargo Parachute Deployment Bags.

(a) Prior to drop, the recovery NCOIC or OIC will designate a spotter for extraction parachutes and deployment bags.

(b) The spotter will observe the extraction parachute and deployment bag of the heavy drop load. He must visually follow the descent of the extraction parachute and the deployment bag so they can be located during recovery.

(c) Disconnect the deployment bag from the deployment line.

(c) The recovered deployment bag will be taken to the site of the cargo parachute, and the recovery team will use it to stow the cargo parachute.

(d) The recovery team will ensure that the cargo parachutes are stowed in their corresponding type of deployment bag (for example, G-11 in the large cotton duck or nylon bag, G-12 in the smaller nylon deployment bag, and so forth).

(2) Techniques for Recovery of G-11 and G-12 Cargo Parachutes.

(a) Use four-man teams and elongate the canopy, lines, and risers. Do not drag the parachute and lines along the ground.

(b) Remove riser extensions and center line at the large clevis and parachute connector (parachute release fingers), if used, and leave the clevis on the riser assembly.

(c) Daisy chain the suspension lines and risers. Do not separate suspension lines and risers at the connector links.

(d) Insert the canopy apex lines through the slot in the top of the deployment bag, recovered in step b(1), and S-fold the canopy, suspension lines, and risers into the deployment bag.

(e) Close and secure the deployment bag with available cord. Do NOT use arming wire lanyard.

c. PILOT AND EXTRACTION PARACHUTES. The 68-inch pilot and extraction parachutes may be rolled and placed inside the deployment bag or rolled and tied separately, and then placed in the deployment bag. It is recommended that the 68-inch pilot parachute be placed on top of the G-12 parachute, inside and still connected to the deployment bag.

d. **LIGHT-CARGO PARACHUTE.** The light-cargo parachute (G-14, 15-, 22-, and 28-foot extraction, 26-foot high-velocity and T-10 cargo) and the deployment bag are normally connected to the airdrop container. Detach the deployment bag and parachute from the container. Recover the parachute as follows:

- (1) Spread the canopy lengthwise on the ground and straighten the suspension lines and risers. S-fold the canopy, suspension lines, and risers into the deployment bag.
- (2) Secure deployment bag with available cord.
- (3) Place light cargo parachutes without a deployment bag in a kit bag.

e. **EXTRACTION LINE BAG.**

- (1) After disconnecting the deployment bag, immediately locate the EPJD, if installed, and remove the safety cap from the side of the EPJD and insert it into the squib cable as shown in Figure 2-11.

WARNING

Do not separate the EPJD, squib cable, squib, or the squib cable safety cap on the DZ.

WARNING

Static electricity or stray electromagnetic energy from transmitters may energize the quib and cause it to fire. Use extreme care when handling the EPJD by its latch if the safety cap is not installed in the end of the squib cable. If the squib fires, the rotating latch assembly can cause bodily injury.

- (2) Place inside the line bag panels all extraction line bag components and items connected to the line bag systems (such as all metal hardware: H-block, EPJD, EFTC link assembly, four-point link assembly, any other link assemblies, or large clevises, and deployment and extraction lines). Tie the panels together with available material.

f. **AIRDROP CONTAINERS.** Place all loose components of the A-7A cargo sling, A-21 and A-22 cargo bags in the center of the container, and fold and secure the container in a convenient manner.

g. **AIRDROP PLATFORM LOAD COMPONENTS.**

- (1) **Airdrop Platforms.** Airdrop platforms to be recovered for evacuation should be separated by size and type. Place dunnage between stacked platforms to prevent damage (honeycomb works well). Platforms should be stacked from the largest to the smallest.

(2) **Deployable Outriggers.** Recover the deployable outriggers and place one set of outriggers per platform on top of each stack of platforms.

(3) **Webbing.** Recover and set aside all suspension slings, riser extensions, and tiedown straps for evacuation.

(4) **Hardware.** Recover and package all hardware components such as EFTC, EPJS cable, and parachute release and set aside for evacuation.

(5) **Wooden Components.** Recover and return wooden products. The wooden components include lumber, wood blocks, plywood (stowage platform, ACS and so forth), and the combat-expendable platform which consists of all of the above.

(6) **Energy-Dissipating Material.** The honeycomb can be reused. However, if it is damaged beyond use it is expendable and may be disposed of accordingly.

h. **MISCELLANEOUS AIRDROP EQUIPMENT.** All parachute release assemblies and components should be recovered with riser extensions and arming lanyards, and packaged for evacuation.

NOTE: DO NOT cut the 1/2-inch tubular nylon arming lanyard or use it for tying items.

DESTRUCTION OF AIRDROP EQUIPMENT

4-5. Airdrop equipment that cannot be recovered, because of severe damage or because of the tactical situation, should be destroyed according to TM 43-0002-1 to prevent enemy use.

TEMPORARY STORAGE OF PARACHUTES AND RELATED AIRDROP EQUIPMENT

4-6. The receiving unit is responsible for providing field storage facilities for recovered parachutes and related airdrop rigging equipment awaiting evacuation to a rear area. A permanent building with a dry floor is desirable for storage because it protects against moisture. Tents with wooden floors are a second choice for storage. It is not likely, however, that you will find ideal storage facilities near a drop zone. The recovery NCOIC/OIC must devise various field expedients to protect the parachutes and related airdrop rigging equipment during the period prior to evacuation to a rear area. To safeguard the recovered items the recovery officer may use various pieces of canvas; all expendable wooden components, including combat-expendable platforms; and the covers from the A-21 and A-22 airdrop containers. The canvas covers make suitable tarpaulins to protect the parachutes from rain and sunlight. The parachute stowage platforms and all airdrop platforms may be used for pallets or temporary shelters. The recovery NCOIC/OIC must consider the following:

a. **PARACHUTES.** Parachutes should be stored:

(1) In a dry area.

- (2) Out of direct sunlight.
 - (3) Free of contact with the ground.
 - (4) In a central assembly area.
 - (5) In stacks, separated by types; for example, heavy cargo, light cargo, personnel, extraction, and pilot parachutes. If possible, store wet and dry parachutes separately.
 - (6) Under camouflage to protect against detection.
 - (7) Under guard to protect against sabotage and pilferage.
- b. **AIRDROP PLATFORMS.** Airdrop platforms should be stored on honeycomb or dunnage to prevent deteriorations.
 - c. **WEBBING.** Webbing should be protected from excess moisture, and nylon webbing should be shielded from direct sunlight.
 - d. **HARDWARE.** Protect hardware from excess moisture by placing a protective cover over hardware whenever possible.
 - e. **CANVAS.** The canvas used with airdrop containers and platforms is usually a mildew- and water-resistant cotton duck. Use it to cover the more critical items of recovered airdrop rigging equipment.
 - f. **PARACHUTE RELEASE.** Place all parachute releases in boxes, if possible and store them in a dry area that is free of dust, rain, or moisture.

SECTION III - RECOVERY OF AIRDROP EQUIPMENT ON THE AIRCRAFT

PERSONNEL EQUIPMENT

4-7. The recovery of static line personnel equipment on the aircraft will be mainly conducted by the safety personnel or loadmasters on the aircraft. Each aircraft will have a minimum of two reserve parachutes, static lines with deployment bags, and kit bags.

- a. Recovery personnel will account for the deployment bags, kit bags and reserve parachutes for each aircraft. There will be one deployment bag for every jumper that exited the aircraft.
- b. Deployment bags will be rolled and placed inside a kit bag.

CONTAINER DELIVERY SYSTEM (CDS) EQUIPMENT

4-8. The recovery of CDS equipment on the aircraft will vary depending on the type of parachute utilized and whether the load is rigged for breakaway or non-breakaway.

- a. If a G-14 cargo parachute is used, there will be a small clevis with static line or just a small clevis recovered.
- b. If a 26-foot high-velocity parachute is used, a static line with deployment bag will be recovered.
- c. If a G-12 cargo parachute is used with 68-inch pilot parachute, there will be a small clevis recovered or a small clevis with static line and deployment bag.

HEAVY DROP EQUIPMENT

4-9. When dropping a DRAS, a 6-inch connector strap must be recovered from the aircraft. There will be one 6-inch connector strap per DRAS platform. The strap consists of a small clevis, 6-inch connector link, and 1-inch connector link shown in Figure 4-1.

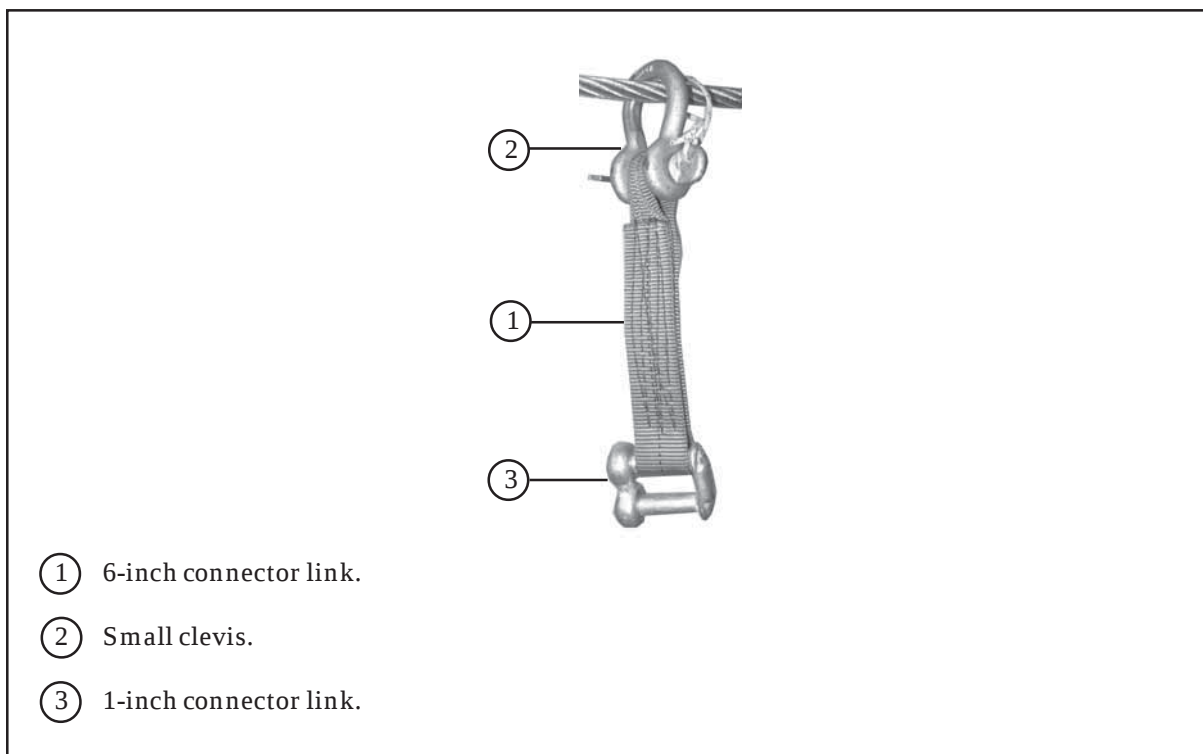


Figure 4-1. 6-Inch Connector Strap

4-10. When the EPJS is used, the components shown in Figure 4-2 must be recovered from the aircraft (if provided by the dropping unit) and placed in the bag provided for the EPJS.

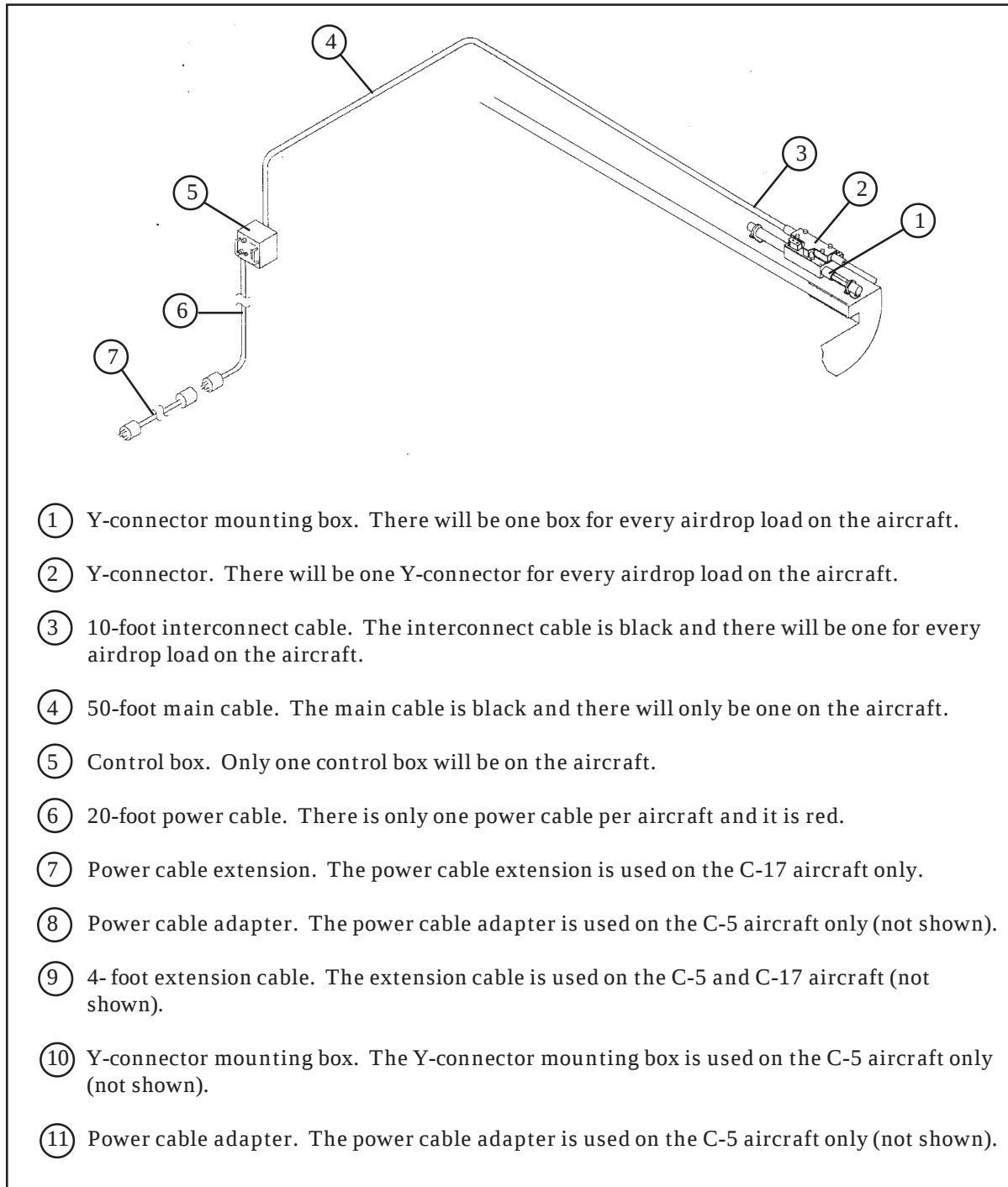


Figure 4-2. EPJS Components on the Aircraft

Chapter 5

Derigging and Recovery Under Special Conditions

GENERAL

5-1. Unusual geographic, climatic, and weather conditions must be considered when you plan and conduct airdrops. Extreme geographic and climatic conditions (such as polar, tropical, desert, marine, and mountainous) will drastically increase completion times of airdrop missions. Factors to consider when derigging and recovering air items in these unusual conditions, such as transportation difficulties, remote and limited facilities, and increased work completion time, are described in this chapter.

POLAR CONDITIONS

5-2. Take the factors listed below into account when you plan and conduct derigging and recovery operations under polar conditions.

a. **WEATHER CONDITIONS.** Both extreme cold and weather are overriding factors when you plan and conduct an operation in polar areas. The weather can change in a moment. Sudden changes from -10 degrees Fahrenheit, no wind, and unlimited visibility to -150 degrees Fahrenheit, 40 knot winds, and zero visibility are not uncommon. The weather phenomenon known as whiteout is an extreme danger to be considered in cold weather operations. Anyone caught unsheltered in a whiteout, probably will not survive.

b. **DROP ZONES.** Because of weather conditions, aircraft may have to be guided exclusively by radio. Weather and solar activity (solar flares and sunspots) interfere with radio transmissions in arctic conditions. Recovery teams must be prepared for the possibility that they may have to recover airdrop items from other than the designated locations and drop zones. In the arctic all drop zones are unimproved. It is unusual to find a DZ free of snow, ice mounds, and pressure ridges (long ridges of ice pushed up when ice floes collide).

c. **DZ RECOVERY.** Due to temperature variations, a thawing and freezing process occurs when air items move from a warm environment (inside) to a cold environment (outside) and vice versa. Metal components and bolts on the airdrop loads and parachutes can freeze, and tools may be needed to loosen and remove the items. Each mission will require special tools to help with the recovery due to the extreme cold. Personnel will have to use wrenches to remove nuts and bolts, pliers to remove safety pins, and screwdrivers to pry frozen items apart. Once air items are recovered and moved to warm locations, the ice and snow melt and saturate them with water, which will damage the items unless personnel take care of them. With the weather being unpredictable and severe, under almost all conditions except whiteout, recovery teams must disconnect the parachutes and recover them immediately after the drop. Otherwise, the parachute will become buried under snow, and recovering them without damage will be nearly impossible. The process of digging out the parachutes damages them. Polar conditions are extremely

hard on personnel. Clothing required for the extreme cold severely limits movement and sight. Mission completion time will be lengthened accordingly.

d. **REMOTE AND LIMITED FACILITIES.** In the polar regions, most airdrops take place in extremely remote locations. As a rule there will be no roads or rails to these locations, and the sites will have limited facilities. Because of these factors, any items that are determined to be non-returnable, such as parachutes, damaged fuel drums, honeycomb, and skid boards, should be consolidated and destroyed. The preferred way to destroy them is by burning. However, you must take environmental and tactical considerations into account.

e. **TRANSPORTATION DIFFICULTIES.** Place recovered items individually in heavy-duty plastic bags for transport. Plastic bags prevent the spreading of contamination (from damaged fuel drum loads, for example), which is difficult to detect due to weather conditions. Recovery vehicles are often limited to sleds and snow vehicles which must make repeated shuttles. The repeated use of the same vehicle may contaminate airdrop equipment if plastic bags are not used.

f. **LIMITED OF AIR DELIVERY METHOD.** Almost all heavy-volume supplies will be brought by airdrop. When personnel recover air items, usually the only way they can move them in polar conditions is by small, light aircraft. Therefore, the use of container delivery systems is the usual method of supply.

TROPICAL CONDITIONS

5-3. Take the unique factors listed below into account when you plan and conduct derigging and recovery operations under tropical conditions.

- a. High humidity.
- b. Dense vegetation in and around drop zones.
- c. Large amounts of precipitation.

These factors are typical of a tropical environment and can affect the completion time of an airdrop recovery mission.

DESERT CONDITIONS

5-4. Take the unique factors listed below into account when you plan and conduct derigging and recovery operations under desert conditions:

- a. Drastic temperature changes.
- b. High winds and sandstorms.
- c. Intense sunlight.
- d. High temperatures.
- e. Sudden sandstorms.

- f. Creatures (some dangerous) seeking shelter from the heat in and under items awaiting to be recovered.

These factors are typical of a desert environment and can affect the completion time of an airdrop recovery mission.

MARINE CONDITIONS (WATER DROP ZONES)

5-5. Take the unique factors listed below into account when you plan and conduct derigging and recovery operations under marine conditions:

- a. Recovery vehicle use (type of boat).
- b. Prior coordination for rinsing parachutes (should be an integral part of the recovery plan).
- c. Under marine conditions there will be a significant increase in the weight of the air items. The weight will affect completion time and the number of recovery personnel required for the airdrop items.

These factors are typical of a marine environment and can affect the completion time of an airdrop recovery mission.

MOUNTAINOUS CONDITIONS

5-6. Take the unique factors listed below into account when you plan and conduct derigging and recovery operations under mountainous conditions:

- a. High elevations.
- b. Extremely uneven surfaces.
- c. Rough terrain.
- d. Severe cold temperatures.
- e. High winds.

These factors are typical of a mountainous environment and can affect the completion time of an airdrop recovery mission.

Glossary

ACB	attitude control bar
AFB	Air Force Base
AFTO	Air Force Technical Order
ARNG	Army National Guard
attn	attention
CDS	container delivery system
DA	Department of the Army
DC	District of Columbia
DRAS	Dual Row Airdrop System
DZ	drop zone
EFTA	extraction force transfer actuator
EFTC	extraction force transfer coupling
EPJD	extraction parachute jettison device
EPJS	extraction parachute jettison system
EOD	explosive ordnance disposal
FM	field manual
HDDS	heavy drop derigging system
HMMWV	high-mobility multipurpose wheeled vehicle
HQ	headquarters
MHE	materials-handling equipment
MOS	military occupational specialty
NCO	noncommissioned officer
NCOIC	noncommissioned officer in charge
no	number
OIC	officer in charge

QRA	quick release assembly
SOP	standing operating procedure
TM	technical manual
TO	technical order
TRADOC	United States Army Training and Doctrine Command
US	United States
USAR	United States Army Reserve

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